

SEARCH REQUEST FORM**Scientific and Technical Information Center**

Requester's Full Name: Jonathan Crepeau Examiner #: 75637 Date: 10-9-01
 Art Unit: 1745 Phone Number: 202-5051 Serial Number: 09/160583
 Mail Box and Bldg/Room Location: CPB-BD01 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

 Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Nonaqueous Secondary Battery
 Inventors (please provide full names): Takako Kamo

Earliest Priority Filing Date: 9-26-97

For Sequence Searches Only Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

A battery or capacitor comprising an electrode (does not matter if positive, negative, anode, or cathode); the electrode comprising one of the following materials:

$A_a S$ where $A = Cu, Ag, or Au, 0.4 \leq a \leq 5$

$B_b D_{(1-b)} S_y$ where $B or D = Cu, Ag, Au, Zn, Al, W, Li$;
 $0.0001 \leq b \leq 0.999; 0 < y < 2$

$E_e G_g J_{(1-e-g)} M_m S_z$ where $E or G or J = Cu, Ag, Au, Zn, Al, W, Li, Mg$; $M = Ca, Sr, Na, K, Rb, O, F, Cl, Br, I$;
 $0.001 \leq e \leq 0.999; 0.001 \leq g \leq 0.999$;
 $0 \leq m \leq 0.2; 0 < z < 2(1+m)$

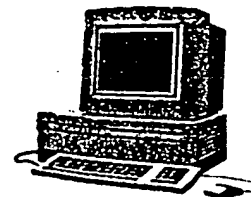
STAFF USE ONLY

	Type of Search	Vendors and cost where applicable
Searcher: <u>JDG</u>	NA Sequence (#) <u>STN</u>	<input checked="" type="checkbox"/>
Searcher Phone #: <u>X-4139</u>	AA Sequence (#) _____	Dialog _____
Searcher Location: <u>EIC 1700</u>	Structure (#) <u>Ref # 3</u>	Questel/Orbit _____
Date Searcher Picked Up: _____	Bibliographic <input checked="" type="checkbox"/>	Dr. Link _____
Date Completed: <u>10-10-01</u>	Litigation _____	Lexis/Nexis _____
Searcher Prep & Review Time: <u>64</u>	Fulltext _____	Sequence Systems _____
Clerical Prep Time: <u>15</u>	Patent Family _____	WWW/Internet _____
Online Time: <u>55</u>	Other _____	Other (specify) _____

EIC1700

Search Results

Feedback Form (Optional)



Scientific & Technical Information Center

The search results generated for your recent request are attached. If you have any questions or comments (compliments or complaints) about the scope or the results of the search, please contact *the EIC searcher* who conducted the search *or contact*:

Kathleen Fuller, Team Leader, 308-4290, CP3/4 3D62

Voluntary Results Feedback Form

➤ *I am an examiner in Workgroup:*

Example:

➤ *Relevant prior art found, search results used as follows:*

- ☐ 102 rejection
- ☐ 103 rejection
- ☐ Cited as being of interest.
- ☐ Helped examiner better understand the invention.
- ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature
(journal articles, conference proceedings, new product announcements etc.)

➤ *Relevant prior art not found:*

- ☐ Results verified the lack of relevant prior art (helped determine patentability).
- ☐ Search results were not useful in determining patentability or understanding the invention.

Other Comments:

Drop off completed forms in CP3/4 - 3D62 .

L1 300 SEA FILE=REGISTRY (CU OR AG OR AU)/ELS (L) S/ELS (L) 2/ELC.SUB
 L2 3952 SEA FILE=REGISTRY (CU OR AG OR AU OR ZN OR AL OR W OR LI)/ELS
 (L) S/ELS (L) 2-3/ELC.SUB
 L5 7705 SEA FILE=REGISTRY (CU OR AG OR AU OR ZN OR AL OR W OR LI OR
 MG)/ELS (P) (CA OR SR OR NA OR K OR RB OR O OR F OR CL OR BR
 OR I)/ELS (P) S/ELS (L) 2-5/ELC.SUB
 L7 117929 SEA FILE=HCAPLUS BATTERY OR CAPACITOR
 L10 366 SEA FILE=HCAPLUS L7 (L) (L1 OR L2 OR L5)
 L11 26 SEA FILE=HCAPLUS L10 AND NONAQUEOUS

=> d all hitstr 1-

YOU HAVE REQUESTED DATA FROM 26 ANSWERS - CONTINUE? Y/(N):y

L11 ANSWER 1 OF 26 HCAPLUS COPYRIGHT 2001 ACS

AN 2000:95943 HCAPLUS

DN 132:125353

TI Boron compounds as anion binding agents for **nonaqueous** battery
 electrolytes

IN Lee, Hung Sui; Yang, Xia-ong; McBreen, James; Xiang, Caili

PA Brookhaven Science Associates, USA

SO U.S., 11 pp.

CODEN: USXXAM

DT Patent

LA English

IC ICM H01M006-14

NCL 429324000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6022643	A	20000208	US 1997-986846	19971208
AB	Novel fluorinated boron-based compds. which act as anion receptors in nonaq. battery electrolytes are provided. The anion receptor is a compd. of formula Q3B, where Q is a F-bearing moiety selected from the group of (CF3)2CHO, (CF3)2C(C6H5)O, (CF3)3CO, FC6H4O, F2C6H3O, F4C6HO, C6F5O, CF3C6H4O, and (CF3)2C6H3O. When added to nonaq. battery electrolytes, the fluorinated boron-based compds. of the invention enhance ionic cond. and cation transference no. of nonaq. electrolytes. The fluorinated boron-based anion receptors include borane and borate compds. bearing different fluorinated alkyl and aryl groups.				
ST	battery electrolyte fluorinated boron based anion receptor				
IT	Battery electrolytes				
	Ionic conductivity				
	(boron compds. as anion binding agents for nonaq. battery electrolytes)				
IT	Intercalation compounds				
	Polyanilines				
	Polyoxyalkylenes, uses				
	Transition metal chalcogenides				
	Transition metal oxides				
	RL: DEV (Device component use); USES (Uses)				
	(boron compds. as anion binding agents for nonaq. battery electrolytes)				
IT	Oxides (inorganic), uses				
	RL: DEV (Device component use); USES (Uses)				
	(intercalation compd. with lithium; boron compds. as anion binding agents for nonaq. battery electrolytes)				
IT	Secondary batteries				
	(lithium; boron compds. as anion binding agents for nonaq. battery electrolytes)				
IT	Polysulfides				

RL: DEV (Device component use); USES (Uses)
(org.; boron compds. as anion binding agents for nonaq. battery electrolytes)

IT Lithium alloy, base

RL: DEV (Device component use); USES (Uses)

(boron compds. as anion binding agents for nonaq. battery electrolytes)

IT 75-05-8, Acetonitrile, uses 96-48-0, .gamma.-Butyrolactone 96-49-1, Ethylene carbonate 107-31-3, Methyl formate 108-32-7, Propylene carbonate 109-87-5, Dimethoxymethane 109-99-9, uses 110-71-4, 1,2-Dimethoxyethane 115-10-6, Dimethyl ether 126-33-0, Sulfolane 534-22-5, 2-Methylfuran 616-38-6, Dimethyl carbonate 646-06-0, 1,3-Dioxolane 872-50-4, uses 1072-47-5, 1,3-Dioxolane, 4-Methyl 1072-71-5, 2,5-Dimercapto-1,3,4-thiadiazole 2923-17-3, Lithium trifluoroacetate 7439-93-2, Lithium, uses 7439-93-2D, Lithium, intercalation compd. with carbon 7440-44-0D, Carbon, intercalation compd. with lithium 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide 7789-24-4, Lithium fluoride, uses 7791-03-9 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer 10377-51-2, Lithium iodide 12031-65-1, Lithium nickel oxide linio2 12057-17-9, Lithium manganese oxide limn2o4 12162-79-7, Lithium manganese oxide limno2 12190-79-3, Cobalt lithium oxide colio2 12201-18-2, Lithium molybdenum sulfide limos2 14283-07-9, Lithium tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate 19836-78-3, 3-Methyl-2-oxazolidinone 21324-40-3, Lithium hexafluorophosphate 25014-41-9, Polyacrylonitrile 25233-30-1, Polyaniline 25322-68-3 25948-29-2, Carbon disulfide, homopolymer 29935-35-1, Lithium hexafluoroarsenate 39448-96-9, Graphite lithium 55326-82-4, Lithium titanium sulfide litis2 55886-04-9, Lithium niobium selenide Li3NbSe3 87187-79-9 87442-01-1, Benzoic acid, pentafluoro-, lithium salt 138187-48-1, Lithium vanadium oxide Lil,2V2O5 256345-13-8, Lithium vanadium oxide (Li2.5V6O13)

RL: DEV (Device component use); USES (Uses)

(boron compds. as anion binding agents for nonaq. battery electrolytes)

IT 121-43-7 659-18-7 755-53-3 856-46-2 1095-03-0 1109-15-5
6919-80-8 32766-52-2 146355-12-6 210834-28-9 210834-35-8
210834-37-0 210834-40-5 210834-42-7

RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)

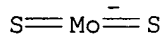
(boron compds. as anion binding agents for nonaq. battery electrolytes)

RE.CNT 19

RE

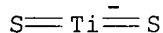
- (1) Angell; US 5849432 1998 HCAPLUS
- (2) Castellanos; US 5468902 1995 HCAPLUS
- (3) Dejonghe; US 4833048 1989 HCAPLUS
- (4) Gregory; US 4752544 1988 HCAPLUS
- (5) Huang; US 5278000 1994
- (6) Johnson; US 4201839 1980 HCAPLUS
- (7) Lamanna; US 5514728 1996 HCAPLUS
- (8) Lee; J Electrochem Soc 1996, V143, P3825 HCAPLUS
- (9) Lonergan; J Am Chem Soc 1995, V117, P2344 HCAPLUS
- (10) Morita; J Electrochem Soc 1987, V134, P2107 HCAPLUS
- (11) Salomon, J; Solution Chem 1990, V19, P1225
- (12) Schmidtchen; Chemical Reviews 1997, V97, P1609 HCAPLUS
- (13) Schroeder; US 2951871 1960 HCAPLUS
- (14) Scrosati; US 5645960 1997
- (15) Shacklette; US 4522901 1985 HCAPLUS
- (16) Siedle; US 5416177 1995 HCAPLUS
- (17) Sotomura; US 5665492 1997 HCAPLUS
- (18) Yang; J Chem Phys 1994, V101(4), P7416
- (19) Yang; Phys Rev 1989, VB40, P7948

IT 12201-18-2, Lithium molybdenum sulfide limos2 55326-82-4
 , Lithium titanium sulfide litis2
 RL: DEV (Device component use); USES (Uses).
 (boron compds. as anion binding agents for nonaq. battery
 electrolytes)
 RN 12201-18-2 HCAPLUS
 CN Molybdate(1-), dithioxo-, lithium (9CI) (CA INDEX NAME)



Li⁺

RN 55326-82-4 HCAPLUS
 CN Titanate(1-), dithioxo-, lithium (9CI) (CA INDEX NAME)



Li⁺

Applicants
 L11 ANSWER 2 OF 26 HCAPLUS COPYRIGHT 2001 ACS

AN 1999:219932 HCAPLUS
 DN 130:225396
 TI **Nonaqueous** secondary battery
 IN Kamo, Takako
 PA Mitsubishi Chemical Corporation, Japan
 SO Eur. Pat. Appl., 16 pp.
 CODEN: EPXXDW
 DT Patent
 LA English
 IC ICM H01M004-58
 ICS H01G009-04
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 905807	A1	19990331	EP 1998-118316	19980928
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 11162467	A2	19990618	JP 1998-243182	19980828
	EP 1119064	A2	20010725	EP 2001-103576	19980928
	EP 1119064	A3	20010926		
	R: DE				

PRAI JP 1997-261577 A 19970926
 JP 1998-243182 A 19980828
 EP 1998-118316 A3 19980928

AB A nonaq. secondary battery having a compd. of any of the general formulas:
 AaS, BbD(1-b)Sy, or EeGgJ(1-e-g)MmSz; where A is Cu, Ag or Au; 0.4
 .ltoreq. a .ltoreq. 5; B and D are different from each other, and are each
 selected from the group consisting of Cu, Ag, Au, Zn, Al, W and Li; 0.001
 .ltoreq. b .ltoreq. 0.999; 0 < y < 2; E, G and J are different from each

other, and are each selected from the group consisting of Cu, Ag, Au, Zn, Al, W, Li and Mg; M is Ca, Sr, Na, K, Rb, O, F, Cl, Br or I; $0.001 < e < 0.999$; $0.001 < g < 0.999$; $0.1 \text{ to } 0.2 \text{ m}^2/\text{m}^2$; and $0 < z < 2(1+m)$, as an active material of an anode is disclosed. This secondary battery features a high voltage and a high energy d., and forms few dendrites of lithium when the battery is repeatedly charged and discharged.

ST anode nonaq secondary battery

IT Battery anodes

Lithium secondary batteries

(anodes for high voltage and high energy d. nonaq. secondary battery)

IT Fluoropolymers, uses

RL: MOA (Modifier or additive use); USES (Uses)

(anodes for high voltage and high energy d. nonaq. secondary battery)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate

1317-40-4, Copper sulfide cus 7791-03-9, Lithium perchlorate

12258-18-3, Silver sulfide ag2s3 21548-73-2, Silver

sulfide ag2s 22205-45-4, Copper sulfide cu2s 29306-15-8

, Gold sulfide aus 76722-93-5, Aluminum silver sulfide (AlAg9S6)

78280-01-0, Gold sulfide aus2 221132-59-8, Silver zinc

sulfide (Ag0.09Zn0.91S0.95) 221132-63-4, Silver zinc sulfide

(Ag0.5Zn0.5S0.75) 221132-67-8, Magnesium silver zinc sulfide

(Mg0.01Ag0.09Zn0.9S0.94) 221132-71-4, Magnesium silver zinc sulfide

(Mg0.08Ag0.08Zn0.83S0.92) 221132-80-5, Copper zinc sulfide

(Cu0.09Zn0.91S0.96) 221132-89-4, Silver zinc sulfide

(Ag0.9Zn0.1S0.55) 221132-92-9, Lithium silver sulfide

(Li0.5Ag0.5S0.25) 221132-97-4, Gold lithium sulfide

(Au0.5Li0.5S0.25) 221133-01-3, Copper lithium sulfide

(Cu0.5Li0.5S0.25) 221133-08-0, Copper lithium sulfide

(Cu0.33Li0.67S0.67) 221133-16-0, Aluminum magnesium silver sulfide

(Al0.09Mg0.01Ag0.9S0.59) 221133-22-8, Aluminum magnesium silver sulfide

(Al0.08Mg0.08Ag0.83S0.62) 221133-28-4, Magnesium silver zinc

chloride sulfide (Mg0.01Ag0.09Zn0.9Cl0.2S0.94) 221133-33-1,

Magnesium silver zinc oxide sulfide (Mg0.01Ag0.09Zn0.9O0.2S0.94)

221133-37-5, Aluminum magnesium silver oxide sulfide

(Al0.09Mg0.01Ag0.9O0.2S0.59) 221133-40-0

RL: DEV (Device component use); USES (Uses)

(anodes for high voltage and high energy d. nonaq. secondary

battery)

IT 7782-42-5, Graphite, uses 9002-84-0, Teflon

RL: MOA (Modifier or additive use); USES (Uses)

(anodes for high voltage and high energy d. nonaq. secondary battery)

RE.CNT 9

RE

(1) Abraham, K; US 4452777 A 1984 HCAPLUS

(2) Comp Generale Electricite; FR 2493607 A 1982

(3) DI Franco, D; US 5041199 A 1991 HCAPLUS

(4) Doudensei Muki Kagoubutsu Gijutsu Kenkyu Kumiai; JP 61099279 A 1986 HCAPLUS

(5) Japan Synthetic Rubber Co Ltd; EP 0284104 A 1988 HCAPLUS

(6) Matsushita Denki Sangyo Kk; JP 60012678 A 1985 HCAPLUS

(7) Plichta, E; US 5154990 A 1992 HCAPLUS

(8) Shuji, I; US 5262255 A 1993 HCAPLUS

(9) Slane, S; US 4983476 A 1991 HCAPLUS

IT 1317-40-4, Copper sulfide cus 12258-18-3, Silver sulfide

ag2s3 21548-73-2, Silver sulfide ag2s 22205-45-4,

Copper sulfide cu2s 29306-15-8, Gold sulfide aus

76722-93-5, Aluminum silver sulfide (AlAg9S6) 78280-01-0

, Gold sulfide aus2 221132-59-8, Silver zinc sulfide

(Ag0.09Zn0.91S0.95) 221132-63-4, Silver zinc sulfide

(Ag0.5Zn0.5S0.75) 221132-80-5, Copper zinc sulfide

(Cu0.09Zn0.91S0.96) 221132-89-4, Silver zinc sulfide

(Ag0.9Zn0.1S0.55) 221132-92-9, Lithium silver sulfide

(Li0.5Ag0.5S0.25) 221132-97-4, Gold lithium sulfide
 (Au0.5Li0.5S0.25) 221133-01-3, Copper lithium sulfide
 (Cu0.5Li0.5S0.25) 221133-08-0, Copper lithium sulfide
 (Cu0.33Li0.67S0.67) 221133-28-4, Magnesium silver zinc chloride
 sulfide (Mg0.01Ag0.09Zn0.9Cl0.2S0.94) 221133-33-1, Magnesium
 silver zinc oxide sulfide (Mg0.01Ag0.09Zn0.900.2S0.94) 221133-37-5
 , Aluminum magnesium silver oxide sulfide (Al0.09Mg0.01Ag0.900.2S0.59)
 221133-40-0

RL: DEV (Device component use); USES (Uses)
 (anodes for high voltage and high energy d. nonaq. secondary
battery)

RN 1317-40-4 HCAPLUS
 CN Copper sulfide (CuS) (8CI, 9CI) (CA INDEX NAME)

Cu=S

RN 12258-18-3 HCAPLUS
 CN Silver sulfide (Ag2S3) (8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	3	7704-34-9
Ag	2	7440-22-4

RN 21548-73-2 HCAPLUS
 CN Silver sulfide (Ag2S) (8CI, 9CI) (CA INDEX NAME)

Ag-S-Ag

RN 22205-45-4 HCAPLUS
 CN Copper sulfide (Cu2S) (8CI, 9CI) (CA INDEX NAME)

Cu-S-Cu

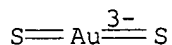
RN 29306-15-8 HCAPLUS
 CN Gold sulfide (AuS) (8CI, 9CI) (CA INDEX NAME)

Au=S

RN 76722-93-5 HCAPLUS
 CN Aluminum silver sulfide (AlAg9S6) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	6	7704-34-9
Ag	9	7440-22-4
Al	1	7429-90-5

RN 78280-01-0 HCAPLUS
 CN Aurate(3-), dithioxo- (9CI) (CA INDEX NAME)



RN 221132-59-8 HCAPLUS

CN Silver zinc sulfide (Ag0.09Zn0.91S0.95) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	0.95	7704-34-9
Zn	0.91	7440-66-6
Ag	0.09	7440-22-4

RN 221132-63-4 HCAPLUS

CN Silver zinc sulfide (Ag0.5Zn0.5S0.75) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	0.75	7704-34-9
Zn	0.5	7440-66-6
Ag	0.5	7440-22-4

RN 221132-80-5 HCAPLUS

CN Copper zinc sulfide (Cu0.09Zn0.91S0.96) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	0.96	7704-34-9
Zn	0.91	7440-66-6
Cu	0.09	7440-50-8

RN 221132-89-4 HCAPLUS

CN Silver zinc sulfide (Ag0.9Zn0.1S0.55) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	0.55	7704-34-9
Zn	0.1	7440-66-6
Ag	0.9	7440-22-4

RN 221132-92-9 HCAPLUS

CN Lithium silver sulfide (Li0.5Ag0.5S0.25) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	0.25	7704-34-9
Ag	0.5	7440-22-4
Li	0.5	7439-93-2

RN 221132-97-4 HCAPLUS

CN Gold lithium sulfide (Au0.5Li0.5S0.25) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number

S		0.25		7704-34-9
Au		0.5		7440-57-5
Li		0.5		7439-93-2

RN 221133-01-3 HCAPLUS
 CN Copper lithium sulfide (Cu0.5Li0.5S0.25) (9CI) (CA INDEX NAME)

Component		Ratio		Component Registry Number
=====	+	=====	+	=====
S		0.25		7704-34-9
Cu		0.5		7440-50-8
Li		0.5		7439-93-2

RN 221133-08-0 HCAPLUS
 CN Copper lithium sulfide (Cu0.33Li0.67S0.67) (9CI) (CA INDEX NAME)

Component		Ratio		Component Registry Number
=====	+	=====	+	=====
S		0.67		7704-34-9
Cu		0.33		7440-50-8
Li		0.67		7439-93-2

RN 221133-28-4 HCAPLUS
 CN Magnesium silver zinc chloride sulfide (Mg0.01Ag0.09Zn0.9Cl0.2S0.94) (9CI)
 (CA INDEX NAME)

Component		Ratio		Component Registry Number
=====	+	=====	+	=====
Cl		0.2		22537-15-1
S		0.94		7704-34-9
Zn		0.9		7440-66-6
Ag		0.09		7440-22-4
Mg		0.01		7439-95-4

RN 221133-33-1 HCAPLUS
 CN Magnesium silver zinc oxide sulfide (Mg0.01Ag0.09Zn0.9O0.2S0.94) (9CI)
 (CA INDEX NAME)

Component		Ratio		Component Registry Number
=====	+	=====	+	=====
O		0.2		17778-80-2
S		0.94		7704-34-9
Zn		0.9		7440-66-6
Ag		0.09		7440-22-4
Mg		0.01		7439-95-4

RN 221133-37-5 HCAPLUS
 CN Aluminum magnesium silver oxide sulfide (Al0.09Mg0.01Ag0.9O0.2S0.59) (9CI)
 (CA INDEX NAME)

Component		Ratio		Component Registry Number
=====	+	=====	+	=====
O		0.2		17778-80-2
S		0.59		7704-34-9
Ag		0.9		7440-22-4
Mg		0.01		7439-95-4

Al | 0.09 | 7429-90-5

RN 221133-40-0 HCAPLUS

CN Aluminum magnesium silver chloride sulfide (Al0.09Mg0.01Ag0.9Cl0.2S0.59)
(9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
Cl	0.2	22537-15-1
S	0.59	7704-34-9
Ag	0.9	7440-22-4
Mg	0.01	7439-95-4
Al	0.09	7429-90-5

L11 ANSWER 3 OF 26 HCAPLUS COPYRIGHT 2001 ACS

AN 1998:15948 HCAPLUS

DN 128:77615

TI **Nonaqueous** electrolyte composition for secondary lithium battery

IN Boguslavsky, Leonid I.; Mikhaylik, Yuriy V.; Gavrilov, Alexei B.;
Skotheim, Terje A.

PA Moltech Corporation, USA; Boguslavsky, Leonid I.; Mikhaylik, Yuriy V.;
Gavrilov, Alexei B.; Skotheim, Terje A.

SO PCT Int. Appl., 38 pp.

CODEN: PIXXD2

DT Patent

LA English

IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9748145	A1	19971218	WO 1997-US10148	19970611
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				

EP 910874 A1 19990428 EP 1997-929943 19970611

R: DE, FR, GB, IT

JP 2000512427 T2 20000919 JP 1998-501807 19970611

AU 9733886 A1 19980107 AU 1997-33886 19970617

US 5962171 A 19991005 US 1997-995370 19971126

PRAI US 1996-664110 A1 19960614

WO 1997-US10148 W 19970611

AB The liq., solid, or gel electrolyte compn. comprises .gtoreq.1 solvent,
.gtoreq.1 sol. Li salt other than Li polysulfide, and an effective Li
stripping enhancing amt. of .gtoreq.1 sol. Li polysulfide, which increases
the Li stripping efficiency at the anode-electrolyte interface compared to
the Li stripping efficiency with none of the sol. Li polysulfides present.
The electrolyte compn. further comprises >100 ppm H2O and the sol. Li
polysulfide is LiS8.

ST electrolyte nonaq lithium octasulfide battery; stripping lithium enhancing
polysulfide battery electrolyte; anode electrolyte interface lithium
stripping enhancing

IT Battery electrolytes

(nonaq. contg. lithium octasulfide for enhancing lithium stripping at

anode-electrolyte interface)
 IT 115672-18-9, Lithium sulfide (Li₂(S₈))
 RL: MOA (Modifier or additive use); USES (Uses)
 (nonaq. **battery** electrolyte contg. for enhancing lithium stripping at anode-electrolyte interface)
 IT 7439-93-2, Lithium, uses
 RL: DEV (Device component use); PRP (Properties); USES (Uses)
 (nonaq. battery electrolyte contg. lithium octasulfide for enhancing lithium stripping at anode-electrolyte interface)
 IT 115672-18-9, Lithium sulfide (Li₂(S₈))
 RL: MOA (Modifier or additive use); USES (Uses)
 (nonaq. **battery** electrolyte contg. for enhancing lithium stripping at anode-electrolyte interface)
 RN 115672-18-9 HCAPLUS
 CN Lithium sulfide (Li₂(S₈)) (9CI) (CA INDEX NAME)

Li-S-S-S-S-S-S-S-S-Li

LII ANSWER 4 OF 26 / HCAPLUS COPYRIGHT 2001 ACS

AN 1995:899098 HCAPLUS

DN 123:291820

TI Secondary **nonaqueous** battery

IN Mishima, Masayuki; Idota, Yoshio

PA Fuji Photo Film Co., Ltd., Japan

SO Eur. Pat. Appl., 19 pp.

CODEN: EPXXDW

DT Patent

LA English

IC ICM H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 671774	A1	19950913	EP 1995-102780	19950227
	EP 671774	B1	19981216		
	R: DE, FR, GB, IT				
	JP 07240200	A2	19950912	JP 1994-30207	19940228
	CA 2143388	AA	19950829	CA 1995-2143388	19950224
	US 5514496	A	19960507	US 1995-393483	19950224
PRAI	JP 1994-30207		19940228		

AB The battery comprises a cathode active material, an anode active material, and a nonaq. electrolyte contg. a Li salt, in which the anode active material contains .gtoreq.1 chalcogenide compd. mainly composed of a Group IVA element of, a Group VA element, In, Zn, or Mg.

ST battery secondary cathode chalcogenide

IT Batteries, secondary

(lithium metal oxide-chalcogenide nonaq.-electrolyte)

IT Anodes

(battery, chalcogenides for nonaq.-electrolyte)

IT 1303-34-0P, Arsenic pentasulfide 1303-37-3P, Arsenic selenide (As₂Se₅)
 1312-42-1P, Indium selenide 1314-87-0P, Lead sulfide (PbS) 1314-91-6P,
 Lead telluride 1314-95-0P, Tin sulfide (SnS) **1314-98-3P**, Zinc
 sulfide, uses 1315-01-1P, Tin disulfide 1315-04-4P, Antimony
 pentasulfide 1315-05-5P, Antimony triselenide 1315-06-6P, Tin selenide
 (SnSe) 1327-50-0P, Antimony tritelluride 1345-04-6P, Antimony
 trisulfide 1345-07-9P, Bismuth sulfide 12010-54-7P, Bismuth selenide
 (BiSe) 12010-57-0P, Bismuth telluride (BiTe) 12024-22-5P, Gallium
 sulfide (Ga₂S₃) 12025-32-0P, Germanium sulfide (GeS) 12025-34-2P,

ZnS only

Germanium disulfide 12030-19-2P, Indium telluride 12032-36-9P,
Magnesium sulfide 12040-02-7P, Tin telluride 12048-34-9P, Bismuth
sulfide (BiS) 12065-11-1P, Germanium diselenide 12069-00-0P, Lead
selenide (PbSe) 12166-58-4P, Tin ditelluride 12260-55-8P, Germanium
ditelluride 13759-10-9P, Silicon disulfide 20770-09-6P, Tin diselenide
37231-03-1P, Indium sulfide 53238-24-7P, Gallium sulfide

RL: DEV (Device component use); PRP (Properties); SPN (Synthetic
preparation); PREP (Preparation); USES (Uses)

(anode for secondary nonaq. **battery**)

IT 169938-66-3, Cobalt lithium oxide (CoLi0.2-1.2O2) 169938-67-4, Lithium
nickel oxide (Li0.2-1.2NiO2) 169938-68-5, Cobalt lithium nickel oxide
(Co0.1-0.9Li0.2-1.2Ni0.1-0.9O2) 169938-69-6, Cobalt lithium vanadium
oxide (Co0.8-0.98Li0.2-1.2V0.02-0.2O2.01-2.3) 169938-70-9, Cobalt iron
lithium oxide (Co0.8-0.98Fe0.02-0.2Li0.2-1.2O2) 169938-71-0, Lithium
manganese oxide (Li0.2-1.2Mn2O4) 169938-72-1, Cobalt lithium manganese
oxide (Co0.04-0.4Li0.2-1.2Mn1.6-1.96O4) 169938-73-2, Lithium manganese
nickel oxide (Li0.2-1.2Mn1.6-1.96Ni0.04-0.4O4) 169938-74-3, Lithium
manganese vanadium oxide (Li0.2-1.2Mn1.6-1.96V0.04-0.4O4) 169938-75-4,
Iron lithium manganese oxide (Fe0.04-0.4Li0.2-1.2Mn1.6-1.96O4)

RL: DEV (Device component use); USES (Uses)

(cathodes for secondary nonaq. battery)

IT 12031-65-1, Lithium nickel oxide (LiNiO2) 12057-17-9, Lithium manganese
oxide (LiMn2O4) 12190-79-3, Cobalt lithium oxide (CoLiO2) 155274-12-7,
Cobalt lithium vanadium oxide (Co0.95LiV0.05O2.07)

RL: DEV (Device component use); PRP (Properties); USES (Uses)

(cathodes for secondary nonaq. battery)

IT 1314-98-3P, Zinc sulfide, uses

RL: DEV (Device component use); PRP (Properties); SPN (Synthetic
preparation); PREP (Preparation); USES (Uses)

(anode for secondary nonaq. **battery**)

RN 1314-98-3 HCAPLUS

CN Zinc sulfide (ZnS) (9CI) (CA INDEX NAME)

S==Zn

L11 ANSWER 5 OF 26 HCAPLUS COPYRIGHT 2001 ACS

AN 1986:195450 HCAPLUS

DN 104:195450

TI Cathode active material for **nonaqueous** batteries

IN Eda, Nobuo; Fujii, Takafumi; Morita, Teruyoshi; Koshina, Hide; Murakami,
Kaoru

PA Matsushita Electric Industrial Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01M004-58

CC 72-3 (Electrochemistry)

Section cross-reference(s): 52

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 60243970	A2	19851203	JP 1984-99067	19840517
AB	A 1:2 (mol ratio) Cu2S-FeS2 mixt. is heated at 550-600.degree. in an inert gas to obtain the active cathode material CuFeS2-x with x = 0.04-0.09. The use of this heating temp. suppresses the formation of product of lower S content and increases the cathode capacity. Thus, 60 g of 1:1 FeS2-Cu2S mixt. was heated in N at 550 .+-. 5.degree. for 5 h to obtain CuFeS1.96.				

CuFeS_{1.80} was obtained heating at 650.degree., and the reaction was not complete at 525.degree.. A nonaq.-electrolyte Li battery having a cathode of a pressed mixt. of CuO 60, CuFeS_{1.96} 40, acetylene black 10, and fluoro-resin binder 7 parts had a high capacity.

ST cathode battery copper iron sulfide
 IT Cathodes
 (battery, copper iron disulfide, manuf. of sulfur-deficient)
 IT 1317-38-0P, uses and miscellaneous
 RL: PREP (Preparation); USES (Uses)
 (cathodes, contg. copper iron sulfide, manuf. of, for
 nonaq.-electrolyte batteries)
 IT 12015-76-8D, sulfur-deficient
 RL: DEV (Device component use); USES (Uses)
 (for **battery** cathodes, manuf. of)
 IT 12015-76-8D, sulfur-deficient
 RL: DEV (Device component use); USES (Uses)
 (for **battery** cathodes, manuf. of)
 RN 12015-76-8 HCAPLUS
 CN Copper iron sulfide (CuFeS₂) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	2	7704-34-9
Cu	1	7440-50-8
Fe	1	7439-89-6

L11 ANSWER 6 OF 26 HCAPLUS COPYRIGHT 2001 ACS

AN 1986:36991 HCAPLUS
 DN 104:36991
 TI Thionyl chloride **nonaqueous** battery
 IN Shimizu, Yasutoshi
 PA Japan Storage Battery Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 3 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM H01M006-14
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 60163370	A2	19850826	JP 1984-18707	19840203
AB	SOCl ₂ battery uses an active metal anode and a 2:1 molar ratio mixt. of AlCl ₃ and alkali-meal or alk. earth salt in SOCl ₂ catholyte. The battery shows a high voltage immediately after assembly, due to a higher electrolyte cond. than that of AlCl ₃ , and has equal battery capacity as the battery using AlCl ₃ in SOCl ₂ catholyte. Thus, a battery using an acetylene black cathode with Ni collector, a Li anode, and SOCl ₂ contg. 4.5 AlCl ₃ and 0.1M LiCl electrolyte, showed 2.5 V voltage 3 s after the addn. of the electrolyte. Cond. of the electrolyte was by a factor of >30 greater than that of 4.5M AlCl ₃ .				
ST	lithium thionyl chloride battery; aluminum lithium chloride battery electrolyte				
IT	Batteries, secondary (lithium-thionyl chloride, with electrolyte contg. aluminum chloride and lithium chloride)				
IT	7447-41-8, uses and miscellaneous 12136-58-2 RL: USES (Uses) (electrolyte contg. aluminum chloride and, thionyl chloride)				

battery)
 IT 7446-70-0, uses and miscellaneous
 RL: USES (Uses)
 (electrolyte contg. lithium chloride and, thionyl chloride battery)
 IT **12136-58-2**
 RL: USES (Uses)
 (electrolyte contg. aluminum chloride and, thionyl chloride
battery)
 RN 12136-58-2 HCAPLUS
 CN Lithium sulfide (Li2S) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

Li-S-Li

L11 ANSWER 7 OF 26 HCAPLUS COPYRIGHT 2001 ACS

AN ~~1985-188112~~ HCAPLUS

DN 102:188112

TI Preparation of electrolyte solution for **nonaqueous** batteries

PA Toshiba Corp., Japan; Toshiba Battery Co., Ltd.

SO Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01M006-14

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 60023971	A2	19850206	JP 1983-130156	19830719
AB	In the prepn. of an electrolyte soln. for nonaq. batteries by dissolving an electrolyte contg. Li2S in a S-contg. liq. oxyhalogen compd., the soln. is freed from free S produced by the reaction by the dissoln. This results in the elimination of a large voltage drop in the initial stage of discharge under heavy load and increases the battery capacity. Thus, 2.3 g Li2S was dissolved in a soln. of 13.3 g AlCl3 in SOCl2 (80 mL) and made up to 100 mL by the addn. of SOCl2. The soln. was cooled to -40.degree. to ppt. free S and filtered. The use of the electrolyte in a battery having a Li anode and a porous C cathode demonstrated the improvements.				
ST	battery thionyl chloride electrolyte prepn; sulfur removal electrolyte battery; lithium sulfide electrolyte battery; aluminum chloride electrolyte battery				
IT	Batteries, primary (lithium, aluminum chloride-lithium sulfide-thionyl chloride soln. for, sulfur removal from)				
IT	7719-09-7				
	RL: USES (Uses) (battery electrolyte of aluminum chloride-lithium sulfide-, sulfur removal from)				
IT	12136-58-2				
	RL: USES (Uses) (battery electrolyte of aluminum chloride-thionyl chloride-, sulfur removal from)				
IT	7446-70-0, uses and miscellaneous				
	RL: USES (Uses) (battery electrolyte of lithium sulfide-thionyl chloride-, sulfur removal from)				
IT	7704-34-9, uses and miscellaneous				
	RL: REM (Removal or disposal); PROC (Process) (removal of, from battery electrolyte of aluminum chloride-lithium				

IT sulfide-thionyl chloride)
 12136-58-2
 RL: USES (Uses)
 (battery electrolyte of aluminum chloride-thionyl chloride-,
 sulfur removal from)
 RN 12136-58-2 HCAPLUS
 CN Lithium sulfide (Li2S) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

Li-S-Li

L11 ANSWER 8 OF 26 HCAPLUS COPYRIGHT 2001 ACS

AN 1985:139809 HCAPLUS

DN 102:139809

TI Isoxazole additives for organic electrolyte of **nonaqueous**
battery

PA Union Carbide Corp., USA

SO Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC H01M006-16

CC 72-3 (Electrochemistry)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 59181464	A2	19841015	JP 1984-57515	19840327
	JP 04015988	B4	19920319		
	US 4489144	A	19841218	US 1983-479744	19830328
	GB 2139409	A1	19841107	GB 1984-7917	19840327
	GB 2139409	B2	19860903		
PRAI	US 1983-479744		19830328		

AB In a nonaq.-electrolyte battery, the solid cathode consists of a solid active material and a small amt. of graphite and(or) C, and the org. electrolyte contains an isoxazole deriv. 0.2-2.0 vol.% (relative to the org. solvent). The high initial open-circuit potential is suppressed.

ST nonaq battery isoxazole additive

IT Batteries, primary

(nonaq., with org. electrolyte contg. isoxazole derivs.)

IT Cathodes

(battery, contg. reducing agents)

IT Calcium alloy, base

Lithium alloy, base

Magnesium alloy, base

Potassium alloy, base

Sodium alloy, base

RL: PRP (Properties)

(anode, in battery with org. electrolyte contg. isoxazole derivs.)

IT 7439-93-2, uses and miscellaneous 7439-95-4, uses and miscellaneous

7440-09-7, uses and miscellaneous 7440-23-5, uses and miscellaneous

RL: DEV (Device component use); USES (Uses)

(anode contg., for battery with org. electrolyte contg. isoxazole derivs.)

IT 7440-70-2, uses and miscellaneous

RL: USES (Uses)

(anode, in battery with org. electrolyte contg. isoxazole derivs.)

IT 288-14-2D, derivs. 300-87-8 5765-44-6

RL: PRP (Properties)

(battery with org. electrolyte contg.)

IT 7429-90-5, uses and miscellaneous 7439-89-6, uses and miscellaneous
 7439-92-1, uses and miscellaneous 7440-03-1, uses and miscellaneous
 7440-31-5, uses and miscellaneous 7440-32-6, uses and miscellaneous
 7440-43-9, uses and miscellaneous 7440-44-0, uses and miscellaneous
 7440-48-4, uses and miscellaneous 7440-66-6, uses and miscellaneous
 7440-67-7, uses and miscellaneous 7440-74-6, uses and miscellaneous
 7782-42-5, uses and miscellaneous
 RL: DEV (Device component use); USES (Uses)
 (cathode contg., for battery with org. electrolyte contg. isoxazole
 derivs.)

IT 1313-13-9, uses and miscellaneous 1313-27-5, uses and miscellaneous
 1314-35-8, uses and miscellaneous 1314-62-1, uses and miscellaneous
 1317-40-4 1335-25-7 1344-70-3 7758-98-7, uses and
 miscellaneous
 RL: USES (Uses)
 (cathode, in **battery** with org. electrolyte contg. isoxazole
 derivs.)

IT 7784-01-2 7784-09-0 11104-61-3 11126-12-8 12013-10-4 12030-24-9
 16812-54-7 51311-17-2
 RL: PRP (Properties)
 (cathode, in battery with org. electrolyte contg. isoxazole derivs.)

IT 1317-40-4
 RL: USES (Uses)
 (cathode, in **battery** with org. electrolyte contg. isoxazole
 derivs.)

RN 1317-40-4 HCAPLUS
 CN Copper sulfide (CuS) (8CI, 9CI) (CA INDEX NAME)

Cu=S

L11 ANSWER 9 OF 26 / HCAPLUS COPYRIGHT 2001 ACS

AN 1985:9771 HCAPLUS

DN 102:9771

TI Manufacture of cathode active material for **nonaqueous** batteries

PA Matsushita Electric Industrial Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 3 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 59171466	A2	19840927	JP 1983-46222	19830318
AB	Chalcopyrite is treated with CS ₂ to provide chalcopyrite suitable for nonaq. battery cathode. Thus, 159 Cu ₂ S and 240 g FeS were mixed and treated at 650.degree. for 5 h in Ar stream. The product contg. excess S (3.1 g) was stirred in 300 mL CS ₂ for 24 h, which removed the excess S, and the compn. corresponded to CuFeS _{1.98} . The compn. mixed with acetylene black and PTFE in 10:1:1 ratio was press formed on Ti mesh. A battery using the obtained cathode, a Li anode, and M LiClO ₄ in 1:2 propylene carbonate/1,3-dioxolane electrolyte showed no deterioration by storage at 60.degree. for 1 mo.				
ST	battery cathode chalcopyrite; sulfur removal chalcopyrite battery cathode				
IT	Batteries, primary (lithium-chalcopyrite, storable nonaq.)				
IT	Cathodes				

(battery, chalcopyrite, sulfur removal with carbon disulfide in manuf. of)

IT 1308-56-1DP, sulfur-deficient, uses and miscellaneous
RL: PREP (Preparation); USES (Uses)
(cathodes, **battery**, sulfur removal with carbon disulfide in manuf. of)
IT 1308-56-1DP, sulfur-deficient, uses and miscellaneous
RL: PREP (Preparation); USES (Uses)
(cathodes, **battery**, sulfur removal with carbon disulfide in manuf. of)
RN 1308-56-1 HCAPLUS
CN Chalcopyrite (CuFeS₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	2	7704-34-9
Cu	1	7440-50-8
Fe	1	7439-89-6

L11 ANSWER 10 OF 26 (HCAPLUS COPYRIGHT 2001 ACS

AN 1985:9770 HCAPLUS

DN 102:9770

TI Manufacture of cathode active material for **nonaqueous** batteries

PA Matsushita Electric Industrial Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 59171465	A2	19840927	JP 1983-46221	19830318

PI JP 59171465 A2 19840927 JP 1983-46221 19830318
AB Chalcopyrite is treated at 150-450.degree. in inert gas stream to remove free S and prep. chalcopyrite suitable for battery cathode. Thus, 159 Cu₂S and 240 g FeS were mixed and treated at 650.degree. for 5 h, in Ar (or N) stream. Part of the product (18.75 g) was again heated in Ar at 300.degree. for 3 h, which decreased the wt. to 18.25 g by removal of free S. The product was mixed with acetylene black and PTFE in 10:1:1 ratio and press formed on Ti mesh. A battery using the obtained cathode, a Li anode, and M LiClO₄ in 1:2 propylene carbonate/1,3-dioxolane electrolyte showed no deterioration by storage at 60.degree. for 1 mo.

ST battery cathode chalcopyrite; lithium chalcopyrite battery

IT Batteries, primary

(lithium-chalcopyrite, storable nonaq.)

IT Cathodes

(battery, chalcopyrite, sulfur removal in manuf. of)

IT 1308-56-1P, uses and miscellaneous

RL: PREP (Preparation); USES (Uses)

(cathodes, **battery**, sulfur removal in manuf. of)

IT 1308-56-1P, uses and miscellaneous

RL: PREP (Preparation); USES (Uses)

(cathodes, **battery**, sulfur removal in manuf. of)

RN 1308-56-1 HCAPLUS

CN Chalcopyrite (CuFeS₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
-----------	-------	------------------------------

Cu Fe S₂

S	2	7704-34-9
Cu	1	7440-50-8
Fe	1	7439-89-6

L11 ANSWER 11 OF 26 HCAPLUS COPYRIGHT 2001 ACS

AN 1983:543201 HCAPLUS

DN 99:143201

TI **Nonaqueous** electrochemical cell

IN Blomgren, George E.; Kronenberg, Marvin L.

PA Union Carbide Corp. , USA

SO U.S., 14 pp. Cont.-in-part of U.S. Ser. No. 212,582.

CODEN: USXXAM

DT Patent

LA English

IC H01M006-14

NCL 429196000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4400453	A	19830823	US 1974-439521	19740204
	ZA 7208971	A	19730926	ZA 1972-8971	19721219
	NL 7217557	A	19730629	NL 1972-17557	19721222
	NL 172807	B	19830516		
	NL 172807	C	19860716		
	AT 321389	B	19750325	AT 1972-10986	19721222
	CH 565457	A	19750815	CH 1972-18805	19721222
	GB 1409307	A	19751008	GB 1972-59372	19721222
	CA 982216	A1	19760120	CA 1972-159861	19721222
	DK 136443	B	19771010	DK 1972-6458	19721222
	NO 142237	B	19800408	NO 1972-4752	19721222
	NO 142237	C	19800716		
	FR 2166015	A1	19730810	FR 1972-46158	19721226
	BR 7209100	A0	19730920	BR 1972-9100	19721226
	JP 48076031	A2	19731013	JP 1973-4545	19721226
	JP 52006446	B4	19770222		
	ES 410039	A1	19751201	ES 1972-410039	19721226
	BE 793372	A1	19730627	BE 1972-125866	19721227
	IT 974314	A	19740620	IT 1972-55024	19721227
	SU 524541	D	19760805	SU 1972-1869370	19721227
	SE 430189	B	19831024	SE 1972-17002	19721227
	SE 430189	C	19861211		
	DK 8305019	A	19831102	DK 1983-5019	19831102
	DK 8305020	A	19831102	DK 1983-5020	19831102
	DK 161116	B	19910527		
	DK 161116	C	19911021		
PRAI	US 1971-212582		19711227		
	DK 1972-6458		19721222		

AB An electrolyte comprising a solute dissolved in a solvent which is an oxyhalide of an element of Group V or VI is used in a nonaq. battery. The oxyhalide serves the dual function of acting as the solvent for the electrolyte salt and as the active cathode depolarizer of the battery. Thus, a Li-graphite battery with polypropylene sheet and poly(tetrafluoroethylene (PTFE) disk separators was assembled. The battery was completed by adding 19 mL of 1M LiAlCl₄ in SO₂Cl₂ and sealing the battery at the top with a PTFE cap. The battery delivered 5 A-h at an av. voltage of 2.3 V. The open-circuit voltage for the battery was 3.60 V.

ST battery nonaq oxyhalide cathode depolarizer; lithium graphite battery

oxyhalide depolarizer; sulfuryl chloride lithium battery
 IT Reduction, electrochemical
 (of sulfur dioxide and sulfur oxychloride)
 IT Batteries, primary
 Batteries, secondary
 (with electrolyte contg. solute dissolved in oxyhalide of Group V or VI
 element, performance of nonaq.)
 IT 507-16-4 7719-09-7 7791-25-5 10025-87-3 14977-61-8
 RL: USES (Uses)
 (battery electrolyte contg., as cathode depolarizer and solvent,
 performance of nonaq.)
 IT 7440-67-7, uses and miscellaneous 7446-70-0, uses and miscellaneous
 7647-18-9 12136-58-2 14024-11-4
 RL: USES (Uses)
 (battery electrolyte contg., performance of nonaq.)
 IT 7446-09-5, reactions
 RL: RCT (Reactant)
 (cathodic redn. of)
 IT 12136-58-2
 RL: USES (Uses)
 (battery electrolyte contg., performance of nonaq.)
 RN 12136-58-2 HCAPLUS
 CN Lithium sulfide (Li2S) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

Li-S-Li

L11 ANSWER 12 OF 26 HCAPLUS COPYRIGHT 2001 ACS

AN 1982:132135 HCAPLUS

DN 96:132135

TI **Nonaqueous** battery

IN Kalnokikis, Tibor

PA Union Carbide Corp. , USA

SO Fr. Demande, 26 pp.

CODEN: FRXXBL

DT Patent

LA French

IC H01M006-14

CC 72-3 (Electrochemistry)

Section cross-reference(s): 37

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	FR 2478377	A1	19810918	FR 1980-5716	19800314

AB A nonaq. battery is described, consisting of an active metal anode, a cathode collector, and an electrolyte-cathode possessing ionic cond. A solute is dissolved in a cathodically active liq. which is enclosed in a vinyl polymer having a formula H2C:CRR', where R is chosen from the groups consisting of H, halogen and C1-5 alkoxy groups; and R' is selected from halogens and C1-5 alkoxy groups. The concn. of vinyl polymer in the electrolyte-cathode is 0.25-4.0 g/L of electrolyte. The vinyl polymer is e.g. a copolymer of vinyl chloride and vinyl acetate or a homopolymer of vinyl chloride. The electrolyte-cathode is Li2S, S2Cl2 or their mixt., as well as .gtoreq.1 oxyhalide such as P oxychloride, SOCl2, sulfuryl chloride, SOBr2, chromyl chloride, vanadyl tribromide or Se oxychloride. The electrolyte-cathode may contain either an inorg. or an org. co-solvent. For example, miniature batteries 12.06 mm in diam. can be made using a Li anode, a C cathode collector, a glass-fiber separator, and an electrolyte-cathode formed from LiAlCl4, 1.5M in SOCl2 with Li2S and 3%

S2Cl2. Also dissolved in the electrolyte-cathode is a copolymer of vinyl acetate 3 and vinyl chloride 97 wt.% or a copolymer of vinyl acetate 14 and vinyl chloride 86 wt.%.

ST nonaq miniature battery; vinyl polymer nonaq battery; lithium battery nonaq miniature

IT Batteries, primary
(miniature, nonaq.)

IT 7439-93-2, uses and miscellaneous
RL: USES (Uses)
(anode, for nonaq. miniature battery)

IT 7440-44-0, uses and miscellaneous
RL: USES (Uses)
(cathode collector, for nonaq. miniature battery)

IT 7719-09-7 9003-22-9 **12136-58-2** 14989-32-3
RL: PRP (Properties)
(cathode-electrolyte contg., for nonaq. miniature **battery**)

IT 14024-11-4
RL: PRP (Properties)
(cathode-electrolyte, for nonaq. miniature battery)

IT 9002-86-2
RL: PRP (Properties)
(electrolyte-cathode contg., for nonaq. miniature battery)

IT **12136-58-2**
RL: PRP (Properties)
(cathode-electrolyte contg., for nonaq. miniature **battery**)

RN 12136-58-2 HCAPLUS

CN Lithium sulfide (Li2S) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

Li-S-Li

L11 ANSWER 13 OF 26 HCAPLUS COPYRIGHT 2001 ACS

AN 1982:43128 HCAPLUS

DN 96:43128

TI Predischarged **nonaqueous** cell

IN Moses, Peter R.

PA Duracell International, Inc., USA

SO U.S., 4 pp. Cont.-in-part of U.S. 4,264,689.
CODEN: USXXAM

DT Patent

LA English

IC H01M006-16

NCL 429050000

CC 72-3 (Electrochemistry)

FAN.CNT 3

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4298663	A	19811103	US 1979-91149	19791105
	US 4264689	A	19810428	US 1979-80891	19791001
	AU 8063770	A1	19810507	AU 1980-63770	19801028
	AU 542946	B2	19850328		
	AU 8063769	A1	19810514	AU 1980-63769	19801028
	AU 530125	B2	19830630		
	GB 2064205	A	19810610	GB 1980-34634	19801028
	GB 2064205	B2	19830316		
	NL 8005959	A	19810601	NL 1980-5959	19801030
	BR 8007078	A	19810512	BR 1980-7078	19801031
	FR 2493606	A1	19820507	FR 1980-23366	19801031
	FR 2493606	B1	19851122		

ZA 8006743	A	19820526	ZA 1980-6743	19801031
CA 1149450	A1	19830705	CA 1980-363720	19801031
CA 1149451	A1	19830705	CA 1980-363721	19801031
SE 8007728	A	19810506	SE 1980-7728	19801104
NO 8003307	A	19810506	NO 1980-3307	19801104
DK 8004680	A	19810506	DK 1980-4680	19801104
BR 8007148	A	19810512	BR 1980-7148	19801104
DE 3041499	A1	19810514	DE 1980-3041499	19801104
DE 3041499	C2	19890622		
BE 886026	A1	19810302	BE 1980-58842	19801105
FR 2469010	A1	19810508	FR 1980-23623	19801105
FR 2469010	B1	19850816		
JP 56082581	A2	19810706	JP 1980-155720	19801105
JP 03053745	B4	19910816		
ZA 8006840	A	19820630	ZA 1980-6840	19801105
ES 496585	A1	19830201	ES 1980-496585	19801105
PRAI US 1979-80891		19791001		
US 1979-91149		19791105		
AB	In this cell an additive is added to the cathode to induce self discharge which partially deactivates substantially all of the active cathode surface thereby reducing the decompn. of the electrolyte solvent. Thus, a cathode for a button-type battery is made by heating .gamma.-MnO2 to convert it to .beta.-MnO2 and mixing this with graphite and PTFE as binder. This cathode wafer fabricated after Li2S is added, is heated and with a Li foil anode assembled into a battery with an electrolyte of LiClO4 in propylene carbonate/dimethoxyethane mixt. Comparisons are given of this cell with cells not contg. the Li2S.			
ST	lithium manganese oxide battery org; sulfide lithium additive manganese oxide			
IT	Cathodes			
	(battery, manganese oxide, lithium sulfide additive for)			
IT	7439-93-2, uses and miscellaneous			
	RL: USES (Uses)			
	(anodes, in batteries with manganese oxide)			
IT	1313-13-9, uses and miscellaneous			
	RL: USES (Uses)			
	(cathodes, battery, lithium sulfide additive for)			
IT	12136-58-2			
	RL: PRP (Properties)			
	(manganese oxide battery cathode contg.)			
IT	12136-58-2			
	RL: PRP (Properties)			
	(manganese oxide battery cathode contg.)			
RN	12136-58-2 HCAPLUS			
CN	Lithium sulfide (Li2S) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)			

Li-S-Li

L11 ANSWER 14 OF 26 HCAPLUS COPYRIGHT 2001 ACS
 AN 1981:594429 HCAPLUS
 DN 95:194429
 TI **Nonaqueous** electrolyte battery
 PA Hitachi Maxell, Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 4 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC H01M006-16; H01M004-06; H01M004-48; H01M004-58

*Ans - cathode
primary batt.*

CC 72-2 (Electrochemistry)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 56084881	A2	19810710	JP 1979-161304	19791211
AB	In a nonaq. electrolyte battery employing a Li anode active material, a FeS-CuS mixt. (d. 2.0-30 g/cm ³) is used as the cathode active material, and 1,2-diphenylethylenediamine is added to the electrolyte. The swelling of cathode mix on battery discharge is suppressed, and the discharge capacity is improved.				
ST	lithium anode sulfide cathode battery; phenylethylenediamine battery electrolyte additive; ethylenediamine phenyl battery electrolyte additive				
IT	Batteries, primary (lithium-sulfide, nonaq.)				
IT	7439-93-2, uses and miscellaneous RL: USES (Uses) (anodes, in nonaq. electrolyte battery with sulfides)				
IT	5700-60-7 RL: PRP (Properties) (battery org. electrolytes contg., for lithium batteries)				
IT	1317-37-9 1317-40-4 RL: PRP (Properties) (cathodes, in lithium nonaq. electrolyte battery)				
IT	1317-40-4 RL: PRP (Properties) (cathodes, in lithium nonaq. electrolyte battery)				
RN	1317-40-4 HCAPLUS				
CN	Copper sulfide (CuS) (8CI, 9CI) (CA INDEX NAME)				

Cu=S

L11 ANSWER 15 OF 26 HCAPLUS COPYRIGHT 2001 ACS

AN 1981:577708 HCAPLUS

DN 95:177708

TI **Nonaqueous** electrolyte battery

PA Sanyo Electric Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 2 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC H01M004-36

CC 72-2 (Electrochemistry)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 56084877	A2	19810710	JP 1979-161873	19791212
	JP 63031899	B4	19880627		
AB	A nonaq. electrolyte battery consists of a Li or Li alloy anode active material and a cathode active material obtained by forming CuO and CuS on localized areas of a Cu substrate (powder).				
ST	lithium anode cupric salt cathode; copper cathode cupric salt coating				
IT	Cathodes (battery, cupric salts on copper substrate for nonaq.)				
IT	Anodes (battery, lithium or lithium alloys for nonaq.)				
IT	7439-93-2, uses and miscellaneous 12057-24-8, uses and miscellaneous RL: USES (Uses) (anodes, in nonaq. electrolyte battery)				

CuS - cathode

IT 1317-38-0, uses and miscellaneous 1317-40-4
 RL: USES (Uses)
 (cathodes, **battery**, on copper substrate)
 IT 7440-50-8, uses and miscellaneous
 RL: USES (Uses)
 (cathodes, battery, with cupric salts)
 IT **1317-40-4**
 RL: USES (Uses)
 (cathodes, **battery**, on copper substrate)
 RN 1317-40-4 HCAPLUS
 CN Copper sulfide (CuS) (8CI, 9CI) (CA INDEX NAME)

Cu=S

L11 ANSWER 16 OF 26 HCAPLUS COPYRIGHT 2001 ACS

AN 1981:451740 HCAPLUS

DN 95:51740

TI **Nonaqueous** electrolyte battery

PA Hitachi Maxell, Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 2 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC H01M006-18

CC 72-2 (Electrochemistry)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 56018373	A2	19810221	JP 1979-93199	19790724
AB	A nonaq. electrolyte battery consists of Li or anode active material, a metal sulfide (FeS, Fe ₂ S ₃ , FeS ₂ , CuS, NiS) as cathode active material, and an inorg. salt (NaBF ₄ , KPF ₆ , Mg(ClO ₄) ₂ , Ca(PF ₆) ₂ , AlCl ₃ , etc.) as solute for the electrolyte.				
ST	lithium battery sulfide inorg solute				
IT	Batteries, primary (nonaq., with lithium anode and sulfide cathode)				
IT	7439-93-2, uses and miscellaneous RL: USES (Uses) (anodes, in nonaq. battery with sulfides)				
IT	1317-37-9	1317-40-4	12063-27-3	12068-85-8	16812-54-7
	RL: PRP (Properties) (cathode, in lithium nonaq. battery)				
IT	7446-70-0, uses and miscellaneous 10034-81-8 RL: USES (Uses) (electrolyte, in lithium nonaq. battery)				
IT	13755-29-8 17084-13-8 78415-39-1 RL: PRP (Properties) (electrolyte, in lithium nonaq. battery)				
IT	1317-40-4 RL: PRP (Properties) (cathode, in lithium nonaq. battery)				
RN	1317-40-4 HCAPLUS				
CN	Copper sulfide (CuS) (8CI, 9CI) (CA INDEX NAME)				

CuS - cathode

Cu=S

L11 ANSWER 17 OF 26 HCAPLUS COPYRIGHT 2001 ACS

AN 1981:159878 HCAPLUS

DN 94:159878

TI **Nonaqueous**-electrolyte batteries

PA Sanyo Electric Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 2 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 55165581	A2	19801224	JP 1979-73666	19790611
	JP 62022227	B4	19870516		
	JP 63211566	A2	19880902	JP 1988-27047	19880208
PRAI	JP 1979-73666		19790611		

AB The title batteries consist of a Li or Na anode, a nonaq. electrolyte, and a cathode prepd. by sintering an Fe sulfide-CuS mixt. in a S atm. Thus, 88 g Fe sulfide was mixed with 96 g CuS, heated for 3 h at 300.degree. in a S atm., pulverized, mixed with 3% graphite and 7% fluoropolymer, compacted, and heated for 3 h at 300.degree. to prep. a cathode. A battery was assembled with the cathode, a polypropylene separator, a Li anode, and a M LiClO4 in propylene carbonate and MeOCH2CH2OMe electrolyte.

ST lithium copper iron sulfide battery; cathode battery copper iron sulfide

IT Batteries, primary

(copper iron sulfide-lithium, with org. electrolyte)

IT Cathodes

(battery, copper iron sulfide)

IT 11126-12-8

RL: USES (Uses)

(cathodes, contg. copper sulfide, in org.-electrolyte battery with lithium anode)

IT **1317-40-4**

RL: USES (Uses)

(cathodes, contg. iron sulfide, in org.-electrolyte **battery** with lithium anode)

IT **1317-40-4**

RL: USES (Uses)

(cathodes, contg. iron sulfide, in org.-electrolyte **battery** with lithium anode)

RN 1317-40-4 HCAPLUS

CN Copper sulfide (CuS) (8CI, 9CI) (CA INDEX NAME)

Cu=S

L11 ANSWER 18 OF 26 HCAPLUS COPYRIGHT 2001 ACS

AN 1981:147521 HCAPLUS

DN 94:147521

TI **Nonaqueous** battery

IN Kalnoki-Kis, T.

PA Union Carbide Corp., USA

SO Belg., 30 pp.

CODEN: BEXXAL

DT Patent

LA French

*CuS - cathode
primary battery*

No

IC H01M-
 CC 72-2 (Electrochemistry)
 Section cross-reference(s): 37
 FAN.CNT 4

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	BE 882242	A1	19800915	BE 1980-199811	19800314
	BR 8001512	A	19801230	BR 1980-1512	19800314
	FR 2460044	A1	19810116	FR 1980-5715	19800314
	NL 8002080	A	19801230	NL 1980-2080	19800409
	JP 56007353	A2	19810126	JP 1980-87680	19800627
	JP 63018838	B4	19880420		
	BR 8005484	A	19820427	BR 1980-5484	19800829
PRAI	US 1979-52463		19790627		

AB A nonaq. battery consisting of an active metal anode, cathode collector, separator positioned between the cathode collector and the anode, and an active liq. electrolyte-cathode is described, where the surface of the separator facing the anode is coated with a vinyl polymer film to present the passivation of the active metal anode during storage and use of the battery. The vinyl polymer is a copolymer of vinyl chloride and vinyl acetate or a homopolymer of vinyl chloride and a homopolymer of vinyl acetate. The electrolyte-cathode comprises Li₂S, S₂Cl₂ or their mixts. and contains at least 1 oxyhalide liq. such as thionyl chloride, sulfuric chloride, P oxychloride, thionyl bromide, chromyl chloride, vanadyl tribromide or selenium oxychloride. An org. or inorg. cosolvent is also used in the electrolyte-cathode. For example, button cells of diam. 12.06 mm contain 0.45 g Li, a cathodic collector of C black and Teflon, a interwoven glass-fiber separator, a soln. of electrolyte-cathode liq. of LiAlCl₄, 1M in SOCl₂, contg. Li₂S to satn. The container is stainless steel. The cells are maintained under diverse conditions then discharged.

ST nonaq battery electrolyte; lithium battery nonaq electrolyte

IT Carbon black, uses and miscellaneous
 RL: USES (Uses)
 (cathode collector from Teflon and, for nonaq. battery)

IT Batteries, primary
 (nonaq.)

IT Glass fibers, uses and miscellaneous
 RL: USES (Uses)
 (separator from interwoven, for nonaq. battery)

IT 7439-93-2, uses and miscellaneous
 RL: USES (Uses)
 (anode, for nonaq. battery)

IT 77088-52-9
 RL: PRP (Properties)
 (anodes, for nonaq. battery)

IT 9002-84-0
 RL: PRP (Properties)
 (cathode collector from carbon black and, for nonaq. battery)

IT 7719-09-7 **12136-58-2** 14024-11-4
 RL: PRP (Properties)
 (electrolyte-cathode contg., for nonaq. battery)

IT 12597-68-1, uses and miscellaneous
 RL: USES (Uses)
 (in nonaq. battery)

IT 9003-22-9
 RL: PRP (Properties)
 (in nonaq. battery)

IT **12136-58-2**
 RL: PRP (Properties)
 (electrolyte-cathode contg., for nonaq. battery)

RN 12136-58-2 HCAPLUS

CN Lithium sulfide (Li₂S) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

Li-S-Li

L11 ANSWER 19 OF 26 HCAPLUS COPYRIGHT 2001 ACS

AN 1981:129457 HCAPLUS

DN 94:129457

TI Battery with **nonaqueous** electrolyte

IN Kalnoki-Kis, T.

PA Union Carbide Corp., USA

SO Belg., 27 pp.

CODEN: BEXXAL

DT Patent

LA French

IC H01M-

CC 72-2 (Electrochemistry)

Section cross-reference(s): 37

FAN.CNT 3

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	BE 882243	A1	19800915	BE 1980-199812	19800314
	BR 8001513	A	19801230	BR 1980-1513	19800314
	NL 8002081	A	19801230	NL 1980-2081	19800409
	IN 154340	A	19841020	IN 1980-DE471	19800623
	JP 56007360	A2	19810126	JP 1980-87681	19800627
	JP 63042377	B4	19880823		
PRAI	US 1979-52467		19790627		

AB A nonaq. battery consisting of an active metal anode, a cathode collector, and an electrolyte-cathode having ionic cond. is described. The latter comprises a solute dissolved in an active cathodic liq.; a vinyl polymer (0.25-4.0 g/L) is dissolved in the electrolyte-cathode. The vinyl polymer is chosen from copolymers of vinyl chloride and vinyl acetate and homopolymers of vinyl chloride. The electrolyte cathode is from a material chosen from Li₂S, S₂Cl₂ or their mixts. and contains at least 1 oxyhalide liq. such as thionyl chloride, sulfuryl chloride, P oxychloride, thionyl bromide, chromyl chloride, vanadyl tribromide and Se oxychloride. An org. or inorg. cosolvent can be present in the electrolyte-cathode. For example, button cells 12.06 mm in diam. using 9 Li anode, a C cathode collector, an interwoven glass-fiber separator and an electrolyte-cathode of LiAlCl₄, 1.5M in SOCl₂ with Li₂S and 3 vol.% S₂Cl₂ are described. A copolymer of vinyl chloride (97%) and vinyl acetate (3%) and a copolymer of vinyl acetate (14%) and vinyl chloride (86%) are dissolved in the electrolyte-cathode of some of the cells. After holding the cells at room temp. for 5 h, they are subjected to open-circuit potential measurements, as well as those of internal resistance, initial discharge voltage, short-circuit current, and discharge capacity. These button cells have a higher initial voltage at the end of 1 s, higher short-circuit current, and lower internal resistance.

ST battery nonaq electrolyte; lithium battery nonaq electrolyte

IT Glass fibers, uses and miscellaneous

RL: USES (Uses)

(separator from interwoven, for battery with nonaq. electrolyte)

IT Batteries, primary

(with nonaq. electrolyte)

IT 7439-93-2, uses and miscellaneous

RL: USES (Uses)

(anode, for battery with nonaq. electrolyte)

IT 7440-44-0, uses and miscellaneous

RL: USES (Uses)
 (cathode collector, for battery with nonaq. electrolyte)
 IT 7719-09-7 9003-22-9 10025-67-9 **12136-58-2** 14024-11-4
 RL: PRP (Properties)
 (electrolyte-cathode contg., for nonaq. **battery**)
 IT **12136-58-2**
 RL: PRP (Properties)
 (electrolyte-cathode contg., for nonaq. **battery**)
 RN 12136-58-2 HCAPLUS
 CN Lithium sulfide (Li2S) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

Li-S-Li

L11 ANSWER 20 OF 26 HCAPLUS COPYRIGHT 2001 ACS

AN 1981:87201 HCAPLUS

DN 94:87201

TI **Nonaqueous** battery

IN Kalnokikis, Tibor

PA Union Carbide Corp., USA

SO Ger. Offen., 30 pp.

CODEN: GWXXBX

DT Patent

LA German

IC H01M004-58; H01M004-36; H01M010-36

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 3005869	A1	19800904	DE 1980-3005869	19800216
	DE 3005869	C2	19840927		
	US 4218523	A	19800819	US 1979-15938	19790228
	IN 153627	A	19840728	IN 1980-DE67	19800130
	CA 1134906	A1	19821102	CA 1980-345043	19800204
	IL 59437	A1	19830515	IL 1980-59437	19800220
	BE 881932	A1	19800826	BE 1980-199557	19800226
	NO 8000536	A	19800829	NO 1980-536	19800226
	BR 8001106	A	19801029	BR 1980-1106	19800226
	ES 488936	A1	19801201	ES 1980-488936	19800226
	DK 8000844	A	19800829	DK 1980-844	19800227
	SE 8001508	A	19800829	SE 1980-1508	19800227
	NL 8001183	A	19800901	NL 1980-1183	19800227
	AU 8055954	A1	19800904	AU 1980-55954	19800227
	AU 535064	B2	19840301		
	JP 55119364	A2	19800913	JP 1980-22896	19800227
	FR 2450506	A1	19800926	FR 1980-4291	19800227
	FR 2450506	B1	19841026		
	GB 2043988	A	19801008	GB 1980-6565	19800227
	GB 2043988	B2	19830803		
	CH 638931	A	19831014	CH 1980-1573	19800227
PRAI	US 1979-15938		19790228		

AB The title battery comprises an anode of Al, an alkali metal, or an alk.-earth metal; a cathode current collector; and an electrolytic depolarizer-catholyte of an oxyhalide (SOCl₂, SO₂Cl₂), AlCl₃ or LiAlCl₄, and a Li₂S, SCl₂, or S₂Cl₂ additive. Thus, several nonaq. Li batteries of the invention were prepd., and their properties (discharge curves and initial and final impedance) were detd.

ST lithium nonaq electrolyte battery; sulfur chloride additive lithium battery

IT Batteries, primary
 (lithium, nonaq.-electrolyte, sulfur-compd. additive-contg.)
 IT 10025-67-9 10545-99-0 12136-58-2
 RL: USES (Uses)
 (catholyte contg., nonaq. lithium-battery)
 IT 12136-58-2
 RL: USES (Uses)
 (catholyte contg., nonaq. lithium-battery)
 RN 12136-58-2 HCAPLUS
 CN Lithium sulfide (Li2S) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

Li-S-Li

L11 ANSWER 21 OF 26 HCAPLUS COPYRIGHT 2001 ACS
 AN 1976-563337 HCAPLUS
 DN 85:163337
 TI **Nonaqueous** cell having an electrolyte containing crotonitrile
 IN Blomgren, George E.; Newman, Gerald H.
 PA Union Carbide Corp., USA
 SO U.S., 7 pp.
 CODEN: USXXAM
 DT Patent
 LA English
 IC H01M004-36
 NCL 136020000
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 FAN.CNT 1

Li-S-cath.

Primary Batt.

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 3953235	A	19760427	US 1974-535716	19741223
	CA 1043866	A1	19781205	CA 1975-242329	19751218
	DE 2557600	A1	19760624	DE 1975-2557600	19751220
	BE 836959	A1	19760622	BE 1975-163022	19751222
	FR 2296277	A1	19760723	FR 1975-39311	19751222
	FR 2296277	B1	19800725		
	JP 51087726	A2	19760731	JP 1975-152031	19751222
	JP 54041689	B4	19791210		
	AU 7587768	A1	19770630	AU 1975-87768	19751222
	GB 1529371	A	19781018	GB 1975-52331	19751222
PRAI	US 1974-535716		19741223		

AB A nonaq. battery uses a highly active metal anode, such as Li, a solid cathode, such as graphite fluoride, CuS, etc., and a liq. org. electrolyte consisting mainly of crotonitrile in combination with a protective cosolvent, preferably propylene carbonate, and an ionizable solute, such as LiClO4. Thus, crotonitrile in combination with 10-30 vol. % propylene carbonate and M LiClO4 [7791-03-9] was admirably suitable electrolyte for Li batteries.

ST primary lithium battery; org electrolyte lithium battery; crotonitrile lithium battery

IT Batteries, primary
 (lithium, with crotonitrile-lithium perchlorate electrolyte)

IT 7439-93-2, uses and miscellaneous
 RL: USES (Uses)

(anodes, in org.-electrolyte battery)

IT 7791-03-9

RL: USES (Uses)

(battery electrolyte contg., crotonitrile-propylene carbonate)

IT 1317-38-0, uses and miscellaneous 1317-40-4 7783-90-6

10028-18-9 11113-63-6
 RL: USES (Uses)
 (cathodes, in org.-electrolyte **battery** with lithium anode)
 IT 1317-40-4
 RL: USES (Uses)
 (cathodes, in org.-electrolyte **battery** with lithium anode)
 RN 1317-40-4 HCAPLUS
 CN Copper sulfide (CuS) (8CI, 9CI) (CA INDEX NAME)

Cu=S

L11 ANSWER 22 OF 26 HCAPLUS COPYRIGHT 2001 ACS

AN 1976:20262 HCAPLUS

DN 84:20262

TI **Nonaqueous** cell having an electrolyte containing sulfolane or an alkyl-substituted derivative of it

IN Mellors, Geoffrey W.

PA Union Carbide Corp., USA

SO U.S., 7 pp.

CODEN: USXXAM

DT Patent

LA English

IC H01M

NCL 136100000R

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 3907597	A	19750923	US 1974-509820	19740927
	CA 1042069	A1	19781107	CA 1975-231532	19750715
	DE 2535473	A1	19760408	DE 1975-2535473	19750808
	BE 832318	A1	19760211	BE 1975-159103	19750811
	SE 7508994	A	19760329	SE 1975-8994	19750811
	SE 409926	B	19790910		
	NL 7509551	A	19760330	NL 1975-9551	19750811
	JP 51042933	A2	19760412	JP 1975-96740	19750811
	JP 54017933	B4	19790704		
	FR 2286512	A1	19760423	FR 1975-24967	19750811
	FR 2286512	B1	19790720		
	AU 7583851	A1	19770217	AU 1975-83851	19750811
	CH 599686	A	19780531	CH 1975-10434	19750811
PRAI	US 1974-509820		19740927		

AB The long-shelf life high-energy d. nonaq. **battery** comprises a highly active metal anode, such as Li [7439-93-2], a solid cathode, such as fluorinated graphite [11113-63-6], CuS [1317-40-4], or the like, and a liq. org. electrolyte consisting essentially of sulfolane or its liq. alkyl-substituted derivs. in combination with a low-viscosity cosolvent, such as dioxolane, and an ionizing solute, such as LiClO4 [7791-03-9].

ST primary battery sulfolane dioxolane

IT Batteries, primary

(lithium-graphite fluoride, high-energy d. and long-shelf life)

IT 7439-93-2, uses and miscellaneous

RL: USES (Uses)

(anodes, in nonaq. primary battery with fluorinated graphite cathode)

IT 7791-03-9 14024-11-4 15138-76-8 17029-22-0 17084-13-8 21324-40-3
 29935-35-1

RL: USES (Uses)

*CuS-carbonade
 primary batt.*

(battery electrolyte contg., dioxolane and sulfolane)
 IT 1317-40-4 11113-63-6
 RL: USES (Uses)
 (cathodes, in nonaq. primary battery with lithium anode)
 IT 1317-40-4
 RL: USES (Uses)
 (cathodes, in nonaq. primary battery with lithium anode)
 RN 1317-40-4 HCAPLUS
 CN Copper sulfide (CuS) (8CI, 9CI) (CA INDEX NAME)

Cu=S

L11 ANSWER 23 OF 26 HCAPLUS COPYRIGHT 2001 ACS
 AN 1975:430749 HCAPLUS
 DN 83:30749
 TI Tungsten oxide-containing cathode for **nonaqueous** battery
 IN Kamenski, Karl F.
 PA du Pont de Nemours, E. I., and Co., USA
 SO U.S., 6 pp.
 CODEN: USXXAM
 DT Patent
 LA English
 IC H01M
 NCL 136083000R
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 FAN.CNT 2

*CuS - where
is it?*

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 3873369	A	19750325	US 1973-360937	19730514
	NL 7406274	A	19741118	NL 1974-6274	19740509
	CA 1011809	A1	19770607	CA 1974-199907	19740513
	DE 2423269	A1	19741128	DE 1974-2423269	19740514
	FR 2230089	A1	19741213	FR 1974-16589	19740514
	JP 50016036	A2	19750220	JP 1974-52931	19740514
	GB 1458882	A	19761215	GB 1974-21283	19740514
PRAI	US 1973-360937		19730514		

AB The cathodically active material of the cathode consists of WO_x, where x = 2.0-2.9. The cathode is useful in a high-energy-d. cell with a light-metal anode and a nonaq. org. liq. electrolyte. A typical buttontype cell is made from circular metal cups with upstanding sides. Inside the stamped sheet-steel cup, and fitted closely, is placed a plastic insulator ring, a Li disk, a nonconductive bibulous separator and a disk-shaped cathode. The electrolyte is added and a top is placed on the edge of the insulator ring. The upstanding sides are bent over and down on the insulator ring, holding and pressing against the top and forcing the metal top against the cathode inside the cell.

ST tungsten oxide battery cathode; battery nonaq cathode

IT Cathodes

(battery, tungsten oxide)

IT Tungsten oxide (WO₃), oxygen-deficient

RL: USES (Uses)

(cathodes, in nonaq. battery with lithium anode)

IT 9000-11-7

RL: USES (Uses)

(binder, for tungsten oxide battery cathodes)

IT 1317-40-4 7439-92-1, uses and miscellaneous 7440-44-0, uses and miscellaneous 7440-50-8, uses and miscellaneous

RL: USES (Uses)
 (cathodes contg., nonaq.-**battery** tungsten oxide)
 IT 11130-73-7
 RL: USES (Uses)
 (cathodes, contg. tungsten oxide, nonaq.-battery)
 IT 12036-22-5
 RL: USES (Uses)
 (cathodes, in nonaq. battery with lithium anode)
 IT **1317-40-4**
 RL: USES (Uses)
 (cathodes contg., nonaq.-**battery** tungsten oxide)
 RN 1317-40-4 HCAPLUS
 CN Copper sulfide (CuS) (8CI, 9CI) (CA INDEX NAME)

Cu=S

111 ANSWER 24 OF 26 HCAPLUS COPYRIGHT 2001 ACS

AN 1973-511193 HCAPLUS

DN 79:111193

TI Self-sealing battery with a **nonaqueous** electrolyte

IN Alder, Hanspeter

PA du Pont de Nemours, E. I., and Co.

SO U.S., 6 pp.

CODEN: USXXAM

DT Patent

LA English

IC H01M

NCL 136006000B

CC 77-2 (Electrochemistry)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 3752704	A	19730814	US 1971-200728	19711122
	GB 1347499	A	19740220	GB 1971-41701	19710907
	CA 970027	A1	19750624	CA 1971-123268	19710920
	FR 2111219	A5	19720602	FR 1971-36455	19711011
	JP 48060104	A2	19730823	JP 1972-90529	19720911
PRAI	US 1970-80050		19701012		
	US 1971-200728		19711122		

AB A primary battery is described in which the anode is Li. The electrolyte consists of LiClO₄ .apprx.10, 1,2-dimethoxyethane 23 and THF 67 wt.%. The cathode is CuS; the conductive plate is stainless steel; and the spacers are polypropylene.

ST lithium cupric sulfide battery perchlorate

IT Batteries, primary

(self-sealing, with nonaq. electrolyte)

IT 7439-93-2, uses and miscellaneous

RL: USES (Uses)

(anodes, self-sealing battery)

IT 7791-03-9

RL: PRP (Properties)

(battery electrolyte)

IT 110-71-4

RL: PRP (Properties)

(battery electrolytes)

IT **1317-40-4**

RL: PRP (Properties)

(cathodes, for self-sealing **battery**)

CuS - cath.
primary

IT 24937-78-8P
 RL: PREP (Preparation)
 (prepn. of)
 IT 109-99-9, uses and miscellaneous
 RL: USES (Uses)
 (swelling of plastic in, in self-sealing batteries)
 IT 110-71-4 111-96-6 300-87-8 646-06-0 31621-87-1
 RL: PRP (Properties)
 (swelling of plastic in, in self-sealing batteries)
 IT 9002-88-4 9003-07-0
 RL: PRP (Properties)
 (swelling of, in nonaq. solvents, in self-sealing batteries)
 IT 1317-40-4
 RL: PRP (Properties)
 (cathodes, for self-sealing battery)
 RN 1317-40-4 HCAPLUS
 CN Copper sulfide (CuS) (8CI, 9CI) (CA INDEX NAME)

Cu=S

L11 ANSWER 25 OF 26 HCAPLUS COPYRIGHT 2001 ACS

AN 1973:105385 HCAPLUS

DN 78:105385

TI High-energy density battery with **nonaqueous** electrolyte

IN Garth, Bruce Hollis

PA du Pont de Nemours, E. I., and Co.

SO Fr. Demande, 14 pp.

CODEN: FRXXBL

DT Patent

LA French

IC H01M

CC 77-2 (Electrochemistry)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	FR 2124389	A5	19720922	FR 1972-3460	19720202
	FR 2124389	B1	19740628		
	CA 975049	A1	19750923	CA 1972-132971	19720121
	GB 1343853	A	19740116	GB 1972-5109	19720202
	US 3778310	A	19731211	US 1972-249049	19720501
PRAI	US 1971-112415		19710203		

AB The battery contains a Li anode, a CuS cathode, and an electrolyte cong. NaPF6 20, 3,5-dimethylisooxazole 55, and 1,2-dimethoxyethane 25 wt.%. High energy output is claimed.

ST battery high energy density nonaq; electrolyte nonaq battery; methylisooxazole battery electrolyte; methoxyethane battery electrolyte

IT Batteries, primary
 (high-energy d., lithium-cupric sulfide system, with nonaq. electrolyte)

IT 7439-93-2, uses and miscellaneous

RL: USES (Usés)

(anodes, in nonaq. primary batteries wit cupric sulfide)

IT 1317-40-4

RL: PRP (Properties)

(cathodes, in nonaq. primary **battery** with lithium anode)

IT 1317-40-4

RL: PRP (Properties)

(cathodes, in nonaq. primary **battery** with lithium anode)

*CuS - cathode
 primary*

RN 1317-40-4 HCAPLUS
CN Copper sulfide (CuS) (8CI, 9CI) (CA INDEX NAME)

maybe?

Cu=S

cathode

Cu₂S - cath.
SEC. Batt.

L11 ANSWER 26 OF 26 HCAPLUS COPYRIGHT 2001 ACS

AN 1971:9084 HCAPLUS

DN 74:9084

TI Half cells with a lithium-aluminum anode, and a practically neutral, inert lithium hexafluorophosphate **nonaqueous** solvent electrolyte

IN Kegelman, Matthew R.

PA du Pont de Nemours, E. I., and Co.

SO Ger. Offen., 28 pp.

CODEN: GWXXBX

DT Patent

LA German

IC H01M

CC 77 (Electrochemistry)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI DE 1935943		19700813		
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PRAI US		19680715		
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AB The electrode is formed by electrodeposition of Li on an Al foil of thickness 0.005-0.05 cm until the combination contains 5-16 wt. % Li. The resulting anode appears to be a Li-Al alloy since its redn. potential is 0.2 V less than that of pure Li. The preferred electrolyte is a 20% soln. of LiPF₆ in DMF, which has a cond. of about 0.02 ohm-1 cm-1. The cathode consists of an oxide, sulfide, carbonate, or oxalate of Cu, Ni, or Fe or of elementary S mixed with C black in paste form or contg. a polymeric binder and worked into a flat structure. For example, Li was deposited on an Al sheet 0.32 .times. 12.7 .times. 12.7 cm from a 10% LiBr soln. in DMF at a c.d. of 10 mA/cm² for 1 hr. A cell from this anode and a paste electrode contg. 75 parts of a 20% soln. of LiPF₆ in DMF, 12 parts CuS powder, and 12 parts C black gave an open circuit voltage of 3 V. The cell was discharged at 200 mA until the voltage decreased to 1.5 V, after which it was then recharged at the same current. The first cycle took 60 min. After 85 cycles the period decreased to less than 2 min, giving a total discharge time of 2500 min.

ST lithium aluminum anode half cell; aluminum lithium anode half cell; anode lithium aluminum half cell; half cell lithium aluminum anode

IT Lithium alloys, containing
(aluminum-, anodes, in secondary batteries with lithium hexafluorophosphate electrolyte)

IT Anodes
(aluminum-lithium alloy, in secondary batteries with lithium hexafluorophosphate electrolyte)

IT Aluminum alloys, base
(lithium-, anodes, in secondary batteries with lithium hexafluorophosphate electrolyte)

IT Batteries, secondary
(with aluminum-lithium alloy anodes in lithium hexafluorophosphate electrolyte)

IT 1317-40-4

RL: PRP (Properties)

(cathodes, in secondary batteries with aluminum-lithium anodes and lithium hexafluorophosphate electrolyte)

IT 1317-38-0, uses and miscellaneous 1317-39-1, uses and miscellaneous

7704-34-9, uses and miscellaneous
 RL: USES (Uses)
 (cathodes, in secondary batteries with aluminum-lithium anodes and
 lithiumhexafluorophosphate electrolyte)
 IT 547-67-1
 RL: PRP (Properties)
 (cathodes, in secondary batteries with aluminum-lithium anodes and
 lithiumhexafluorophosphate electrolyte)
 IT 814-91-5 815-82-7 1317-37-9 3164-31-6 10028-18-9 12069-69-1
 13601-13-3 16812-54-7 **22205-45-4**
 RL: PRP (Properties)
 (cathodes, in secondary **battery** with aluminum-lithium anode
 and lithium hexafluorophosphate electrolyte)
 IT **22205-45-4**
 RL: PRP (Properties)
 (cathodes, in secondary **battery** with aluminum-lithium anode
 and lithium hexafluorophosphate electrolyte)
 RN 22205-45-4 HCAPLUS
 CN Copper sulfide (Cu₂S) (8CI, 9CI) (CA INDEX NAME)

Cu-S-Cu

ALL ORGANIC COMPOUNDS OR ACIDS/HYDROXIDES

L1 300 SEA FILE=REGISTRY (CU OR AG OR AU)/ELS (L) S/ELS (L) 2/ELC.SUB
 L2 3952 SEA FILE=REGISTRY (CU OR AG OR AU OR ZN OR AL OR W OR LI)/ELS
 (L) S/ELS (L) 2-3/ELC.SUB
 L4 12369 SEA FILE=REGISTRY (CU OR AG OR AU OR ZN OR AL OR W OR LI OR
 MG)/ELS (L) (CA OR SR OR NA OR K OR RB OR O OR F OR CL OR BR
 OR I)/ELS (L) S/ELS (L) 2-5/ELC.SUB
 L5 7705 SEA FILE=REGISTRY (CU OR AG OR AU OR ZN OR AL OR W OR LI OR
 MG)/ELS (P) (CA OR SR OR NA OR K OR RB OR O OR F OR CL OR BR
 OR I)/ELS (P) S/ELS (L) 2-5/ELC.SUB
 L7 117929 SEA FILE=HCAPLUS BATTERY OR CAPACITOR
 L10 366 SEA FILE=HCAPLUS L7 (L) (L1 OR L2 OR L5)
 L11 26 SEA FILE=HCAPLUS L10 AND NONAQUEOUS
 L14 14803 SEA FILE=HCAPLUS NONAQUEOUS
 L17 54585 SEA FILE=HCAPLUS (ELECTROCHEM?(S)CELL OR L7) (S) (ELECTRODE OR
 ANODE OR CATHODE)
 L18 494 SEA FILE=HCAPLUS L4 AND L17
 L19 87 SEA FILE=HCAPLUS (L14 OR NONAQ) AND L18
 L20 85 SEA FILE=HCAPLUS L19 NOT L11
 L21 42 SEA FILE=HCAPLUS (NEGATIVE(S)ELECTRODE OR ANODE OR NEG
 ELECTRODE) AND L20

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YOU HAVE REQUESTED DATA FROM 42 ANSWERS - CONTINUE? Y/(N):y

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L21 ANSWER 1 OF 42 HCAPLUS COPYRIGHT 2001 ACS

AN 2001:691890 HCAPLUS

DN 135:229388

TI **Nonaqueous electrolyte battery** with lithium transition
 metal oxide **cathode**

IN Yamaura, Kiyoshi

PA Sony Corporation, Japan

SO Eur. Pat. Appl., 11 pp.

CODEN: EPXXDW

DT Patent

LA English

IC ICM H01M004-50

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1134825	A2	20010919	EP 2001-1105813	20010308
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2001266881	A2	20010928	JP 2000-81858	20000317
PRAI	JP 2000-81858	A	20000317		

AB A **nonaq.** electrolyte **battery** comprises a
cathode contg. a Li-transition metal oxide **cathode**
 active material, an **anode** contg. C compd. or Li, and a
nonaq. electrolyte interposed between the **anode** and the
cathode; wherein the Li-transition metal oxide is Li_xMnO_2 or
 $\text{Li}_x\text{Mn}_{1-y}\text{Al}_y\text{O}_2$ where $x = 0.94-0.96$ and $y = 0.06-0.25$.

ST **battery cathode** lithium transition metal oxide

IT Transition metal oxides

RL: DEV (Device component use); USES (Uses)

(lithiated; **nonaq.** electrolyte **battery** with lithium
 transition metal oxide **cathode**)

IT Secondary batteries

(lithium; **nonaq.** electrolyte **battery** with lithium
 transition metal oxide **cathode**)

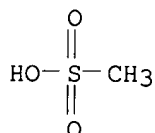
IT **Battery cathodes**
 (nonaq. electrolyte **battery** with lithium transition
 metal oxide **cathode**)

IT 50-21-5D, Lactic acid, ester 60-29-7, Diethyl ether, uses 64-19-7D,
 Acetic acid, ester 75-05-8, Acetonitrile, uses 79-09-4D, Propionic
 acid, ester 96-47-9, 2-Methyl tetrahydrofuran 96-48-0,
 .gamma.-Butyrolactone 96-49-1, Ethylene carbonate 100-66-3, Anisole,
 uses 105-58-8, Diethyl carbonate 107-12-0, Propionitrile 108-32-7,
 Propylene carbonate 109-99-9, Thf, uses 110-71-4, 1,2-Dimethoxyethane
 126-33-0, Sulfolane 616-38-6, Dimethyl carbonate 646-06-0,
 1,3-Dioxolane 1072-47-5, 4-Methyl-1,3-dioxolane **2550-62-1**,
 Methanesulfonic acid, lithium salt 7447-41-8, Lithium chloride, uses
 7550-35-8, Lithium bromide 7791-03-9, Lithium perchlorate 14283-07-9,
 Lithium tetrafluoroborate 14485-20-2, Lithium tetraphenylborate
 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium
 hexafluoroarsenate 33454-82-9, Lithium triflate 359793-57-0
 RL: DEV (Device component use); USES (Uses)
 (nonaq. electrolyte **battery** with lithium transition
 metal oxide **cathode**)

IT 359793-58-1P 359793-59-2P 359793-60-5P 359793-63-8P
 RL: DEV (Device component use); SPN (Synthetic preparation); PREP
 (Preparation); USES (Uses)
 (nonaq. electrolyte **battery** with lithium transition
 metal oxide **cathode**)

IT **2550-62-1**, Methanesulfonic acid, lithium salt
 RL: DEV (Device component use); USES (Uses)
 (nonaq. electrolyte **battery** with lithium transition
 metal oxide **cathode**)

RN 2550-62-1 HCAPLUS
 CN Methanesulfonic acid, lithium salt (9CI) (CA INDEX NAME)



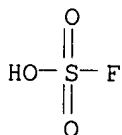
Li

L21 ANSWER 2 OF 42 HCAPLUS COPYRIGHT 2001 ACS
 AN 2001:488749 HCAPLUS
 DN 135:79459
 TI Preparation of a mixed metal oxide cathode active material by sequential
 decomposition and combination reactions
 IN Leising, Randolph A.; Takeuchi, Esther S.
 PA Wilson Greatbatch Ltd., USA
 SO Eur. Pat. Appl., 18 pp.
 CODEN: EPXXDW
 DT Patent
 LA English
 IC ICM H01M004-48
 ICS H01M004-54
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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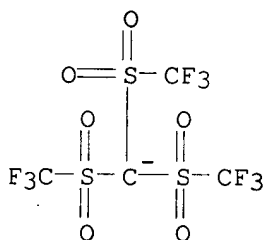
PI EP 1113514 A1 20010704 EP 2000-311738 20001228
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
 IE, SI, LT, LV, FI, RO
 JP 2001243955 A2 20010907 JP 2000-401298 20001228
 PRAI US 1999-173407 P 19991228
 AB A mixed metal oxide, such as silver vanadium oxide, prepd. by sequential
 decompn. and combination reactions is disclosed. In the case of silver
 vanadium oxide, the product material is produced from a decomposable salt
 of silver and vanadium oxide first heated above the decompn. temp. of the
 silver salt followed by cooling and then a second heating above the
 decompn. temp. The product silver vanadium oxide material is coupled with
 a lithium **anode** and activated with a **nonaq.**
 electrolyte to provide an improved high energy d. **electrochem.**
cell having increased pulse voltages and a redn. in voltage delay.
 ST **battery cathode** mixed metal oxide sequential decompn;
 silver vanadium oxide **cathode battery**
 IT Primary batteries
 (lithium; prepn. of mixed metal oxide cathode active material by
 sequential decompn. and combination reactions)
 IT **Battery** cathodes
 Reaction
 (prepn. of mixed metal oxide **cathode** active material by
 sequential decompn. and combination reactions)
 IT Alkali metals, uses
 Esters, uses
 Ethers, uses
 RL: DEV (Device component use); USES (Uses)
 (prepn. of mixed metal oxide cathode active material by sequential
 decompn. and combination reactions)
 IT Thermal decomposition
 (sequential; prepn. of mixed metal oxide cathode active material by
 sequential decompn. and combination reactions)
 IT 108-32-7, Propylene carbonate 110-71-4 556-65-0, Lithium thiocyanate
 2923-17-3 2923-20-8 7439-93-2, Lithium, uses 7790-69-4, Lithium
 nitrate 7791-03-9, Lithium perchlorate **13453-75-3**, Lithium
 fluorosulfonate 14024-11-4, Lithium tetrachloroaluminate 14283-07-9,
 Lithium tetrafluoroborate 14485-20-2, Lithium tetraphenylborate
 15955-98-3, Lithium tetrachlorogallate 18424-17-4, Lithium
 hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate
 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate
 90076-65-6 115028-88-1 **132404-42-3**
 RL: DEV (Device component use); USES (Uses)
 (prepn. of mixed metal oxide cathode active material by sequential
 decompn. and combination reactions)
 IT 11105-02-5P, Silver vanadium oxide 12026-36-7P, Silver vanadium oxide
 AgV2O5.5 173478-95-0P, Silver vanadium oxide Ag0.35V2O5.18
 346712-58-1P, Silver vanadium oxide (Ag0.8V2O5.4)
 RL: DEV (Device component use); SPN (Synthetic preparation); PREP
 (Preparation); USES (Uses)
 (prepn. of mixed metal oxide cathode active material by sequential
 decompn. and combination reactions)
 IT 534-16-7, Silver carbonate 563-63-3, Silver acetate 1314-62-1,
 Vanadium pentoxide, reactions 15525-64-1
 RL: RCT (Reactant)
 (prepn. of mixed metal oxide cathode active material by sequential
 decompn. and combination reactions)
 RE: CNT 3
 RE
 (1) Liang, C; US 4391729 A 1983 HCAPLUS
 (2) Medtronic Inc; EP 0856490 A 1998 HCAPLUS
 (3) Takeuchi, E; US 5695892 A 1997 HCAPLUS

IT 13453-75-3, Lithium fluorosulfonate 132404-42-3
 RL: DEV (Device component use); USES (Uses)
 (prepn. of mixed metal oxide cathode active material by sequential
 decompn. and combination reactions)
 RN 13453-75-3 HCAPLUS
 CN Fluorosulfuric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



Li

RN 132404-42-3 HCAPLUS
 CN Methane, tris[(trifluoromethyl)sulfonyl]-, ion(1-), lithium (9CI) (CA
 INDEX NAME)



● Li⁺

L21 ANSWER 3 OF 42 HCAPLUS COPYRIGHT 2001 ACS
 AN 2001:356691 HCAPLUS
 DN 134:342554
 TI Secondary **nonaqueous** electrolyte batteries
 IN Kato, Keiichi; Inaba, Yukishige; Nitta, Yoshiaki; Watanabe, Shoichiro
 PA Matsushita Electric Industrial Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 7 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM H01M010-40
 ICS H01M004-02; H01M004-58; H01M004-66
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001135352	A2	20010518	JP 1999-309305	19991029
AB	The batteries have Li intercalating cathodes with Al-Mg-Si alloy collectors, Si phase contg. Si alloy anodes, and electrolyte solns. contg. CF ₃ SO ₃ Li, (CF ₃ SO ₂) ₂ NLi, (CF ₃ SO ₂) ₃ CLi, and/or (C ₂ F ₅ SO ₂) ₂ NLi.				
ST	secondary lithium battery electrode electrolyte				

comps; aluminum magnesium silicon alloy lithium **battery**
cathode collector; silicon alloy **anode** lithium
battery; perfluoroalkyl sulfur deriv lithium battery electrolyte

IT **Battery electrolytes**
 (electrolytes for lithium batteries with aluminum-magnesium-silicon
 alloy **cathode** collectors and silicon alloy anodes)

IT Battery cathodes
 (lithium intercalating cathodes contg. aluminum-magnesium-silicon alloy
 collectors for secondary lithium batteries)

IT Secondary batteries
 (lithium; comps. of cathode collector alloys and **anode**
 alloys and electrolytes for secondary lithium batteries)

IT Battery anodes
 (silicon alloys contg. silicon phase for anodes in secondary lithium
 batteries)

IT 33454-82-9, Lithium trifluoromethanesulfonate 90076-65-6
 132404-42-3 132843-44-8
 RL: DEV (Device component use); USES (Uses)
 (electrolytes for lithium batteries with aluminum-magnesium-silicon
 alloy cathode collectors and silicon alloy anodes)

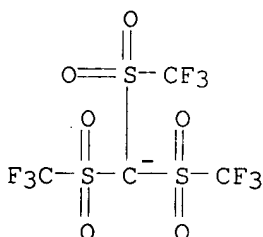
IT 12617-23-1 52627-24-4, Cobalt lithium oxide
 RL: DEV (Device component use); USES (Uses)
 (lithium intercalating cathodes contg. aluminum-magnesium-silicon alloy
 collectors for secondary lithium batteries)

IT 7440-21-3, Silicon, uses 12201-89-7, Nickel silicide (NiSi₂)
 RL: DEV (Device component use); PEP (Physical, engineering or chemical
 process); PROC (Process); USES (Uses)
 (silicon alloys contg. silicon phase for anodes in secondary lithium
 batteries)

IT 132404-42-3
 RL: DEV (Device component use); USES (Uses)
 (electrolytes for lithium batteries with aluminum-magnesium-silicon
 alloy cathode collectors and silicon alloy anodes)

RN 132404-42-3 HCAPLUS

CN Methane, tris[(trifluoromethyl)sulfonyl]-, ion(1-), lithium (9CI) (CA
 INDEX NAME)



● Li⁺

Q21 ANSWER 4 OF 42 HCAPLUS COPYRIGHT 2001 ACS
 AN 2001:356161 HCAPLUS
 DN 134:342533
 TI Electrochemical cell containing **nonaqueous** electrolyte
 IN Schmidt, Michael; Kuehner, Andreas; Niemann, Marlies
 PA Merck Patent G.m.b.H., Germany
 SO Ger. Offen., 8 pp.

CODEN: GWXXBX
 DT Patent
 LA German
 IC ICM H01M010-40
 ICS H01G009-038
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 10042149	A1	20010517	DE 2000-10042149	20000826
PRAI	DE 1999-19944603	A1	19990917		

AB A **nonaq.** electrolyte for an electrochem. cell comprises .gtoreq.1 F-contg. supporting electrolyte, by choice .gtoreq.1 org. solvent for the supporting electrolyte and .gtoreq.1 org. isocyanate in a quantity effective to lower the water content of the electrolyte. An **electrochem. cell** contains an **anode**, a **cathode**, and the above electrolyte arranged between them is a Li ion **battery** or a supercapacitor. The electrolyte according to invention and the electrochem. cell according to invention possess excellent chem. and electrochem. stability.

ST battery **nonaq** electrolyte isocyanate; supercapacitor **nonaq** electrolyte isocyanate

IT Battery electrolytes
 (electrochem. cell contg. **nonaq.** electrolyte)

IT Secondary batteries
 (lithium; electrochem. cell contg. **nonaq.** electrolyte)

IT Electrolytes
 (**nonaq.**; electrochem. cell contg. **nonaq.** electrolyte)

IT Isocyanates
 RL: DEV (Device component use); USES (Uses)
 (org.; electrochem. cell contg. **nonaq.** electrolyte)

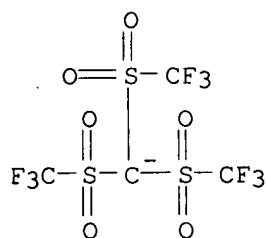
IT Capacitors
 (supercapacitor; electrochem. cell contg. **nonaq.** electrolyte)

IT 67-68-5, Dms0, uses 75-05-8, Acetonitrile, uses 79-20-9, Methyl acetate 96-48-0, .gamma.-Butyrolactone 96-49-1, Ethylene carbonate 103-71-9, Phenyl isocyanate, uses 105-37-3, Ethyl propionate 105-54-4, Ethyl butyrate 105-58-8, Diethyl carbonate 107-13-1, Acrylonitrile, uses 108-32-7, Propylene carbonate 126-33-0, Sulfolane 141-78-6, Ethyl acetate, uses 554-12-1, Methyl propionate 616-38-6, Dimethyl carbonate 623-42-7, Methyl butyrate 623-53-0, Ethyl Methyl carbonate 646-06-0, Dioxolane 14283-07-9, Lithium tetrafluoroborate 17337-13-2, 2-Biphenylisocyanate 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 27359-20-2, Phenyl diisocyanate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 56525-42-9, Methyl propyl carbonate 90076-65-6 **132404-42-3**
 RL: DEV (Device component use); USES (Uses)
 (electrochem. cell contg. **nonaq.** electrolyte)

IT **132404-42-3**
 RL: DEV (Device component use); USES (Uses)
 (electrochem. cell contg. **nonaq.** electrolyte)

RN 132404-42-3. HCAPLUS

CN Methane, tris[(trifluoromethyl)sulfonyl]-, ion(1-), lithium (9CI) (CA INDEX NAME)



● Li⁺

L21 ANSWER 5 OF 42 HCAPLUS COPYRIGHT 2001 ACS

AN 2001:246683 HCAPLUS

DN 134:254689

TI **Nonaqueous** electrolyte secondary battery

IN Yamaguchi, Akira; Hatake, Shinji; Omaru, Atsuo; Nagamine, Masayuki

PA Sony Corporation, Japan

SO Eur. Pat. Appl., 20 pp.

CODEN: EPXXDW

DT Patent

LA English

IC ICM H01M004-62

ICS H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1089366	A1	20010404	EP 2000-121433	20000929
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2001102049	A2	20010413	JP 1999-278249	19990930
	CN 1301052	A	20010627	CN 2000-129286	20000930
PRAI	JP 1999-278249	A	19990930		

AB A **nonaq.** electrolyte secondary **battery** is disclosed with a pos. **electrode** including a pos.-**electrode** active material, a **neg. electrode** including a **neg.-electrode** active material, and a **nonaq.** electrolyte soln. The **neg. electrode** further includes carbon fibers and carbon flakes. The synergistic effects of the improved retention of the electrolyte soln. by the carbon fibers and the improved cond. between the active material particles by the carbon flakes facilitate doping/undoping of lithium in a high-load current mode and increase the capacity of the battery in the high-load current mode.

ST battery **nonaq** electrolyte secondary

IT Coal tar pitch

(binder; **nonaq.** electrolyte secondary battery)

IT EPDM rubber

Fluoropolymers, uses

Styrene-butadiene rubber, uses

RL: TEM (Technical or engineered material use); USES (Uses)

(binder; **nonaq.** electrolyte secondary battery)

IT Secondary batteries

(lithium; **nonaq.** electrolyte secondary battery)

IT Battery anodes

Battery cathodes

Battery electrolytes

(**nonaq.** electrolyte secondary battery)

IT Carbon fibers, uses
Carbonaceous materials (technological products)
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)

(**nonaq.** electrolyte secondary battery)

IT Coke
RL: RCT (Reactant)

(**nonaq.** electrolyte secondary battery)

IT 9002-84-0, Ptfе 24937-79-9, Pvdф
RL: TEM (Technical or engineered material use); USES (Uses)
(binder; **nonaq.** electrolyte secondary battery)

IT 7440-44-0, Carbon, uses
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(flakes; **nonaq.** electrolyte secondary battery)

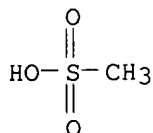
IT 60-29-7, Diethyl ether, uses 75-05-8, Acetonitrile, uses 96-48-0, .gamma.-Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 107-12-0, Propionitrile 108-32-7, Propylene carbonate 109-99-9, Thf, uses 110-71-4, 1,2-Dimethoxyethane 126-33-0, Sulfolane 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 646-06-0, 1,3-Dioxolane 872-36-6, Vinylene carbonate 1072-47-5, 4-Methyl-1,3-dioxolane **2550-62-1**, Lithium methanesulfonate 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide 7782-42-5, Graphite, uses 7791-03-9, Lithium perchlorate 11113-67-0, Iron lithium oxide 11126-15-1, Lithium vanadium oxide 12190-79-3, Cobalt lithium oxide colio2 14283-07-9, Lithium tetrafluoroborate 14485-20-2, Lithium tetraphenylborate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 35678-71-8, Methylsulfolane 37220-89-6, Aluminum lithium oxide 39300-70-4, Lithium nickel oxide 39302-37-9, Lithium titanium oxide 39457-42-6, Lithium manganese oxide 52627-24-4, Cobalt lithium oxide
RL: DEV (Device component use); USES (Uses)
(**nonaq.** electrolyte secondary battery)

IT 9003-55-8
RL: TEM (Technical or engineered material use); USES (Uses)
(styrene-butadiene rubber, binder; **nonaq.** electrolyte secondary battery)

RE.CNT 14
RE
(1) Ahn, S; WO 9900001 A 1999 HCAPLUS
(2) Anon; PATENT ABSTRACTS OF JAPAN 1989, V013(086), PE-720
(3) Anon; PATENT ABSTRACTS OF JAPAN 1996, V1996(11)
(4) Anon; PATENT ABSTRACTS OF JAPAN 1997, V1997(05)
(5) Anon; PATENT ABSTRACTS OF JAPAN 1997, V1997(03)
(6) Anon; PATENT ABSTRACTS OF JAPAN 2000, V2000(05)
(7) Anon; PATENT ABSTRACTS OF JAPAN 2000, V2000(08)
(8) Japan Storage Battery Co Ltd; JP 2000058066 A 2000 HCAPLUS
(9) Matsushita Electric Ind Co Ltd; JP 08180864 A 1996 HCAPLUS
(10) Matsushita Electric Ind Co Ltd; JP 08287952 A 1996 HCAPLUS
(11) Shin Kobe Electric Mach Co Ltd; JP 63264865 A 1988 HCAPLUS
(12) Sony Corp; JP 09027344 A 1997 HCAPLUS
(13) Sony Corp; EP 0871233 A 1998 HCAPLUS
(14) Toyota Central Res & Amp; JP 2000133267 A 2000 HCAPLUS

IT **2550-62-1**, Lithium methanesulfonate
RL: DEV (Device component use); USES (Uses)
(**nonaq.** electrolyte secondary battery)

RN **2550-62-1** HCAPLUS
CN Methanesulfonic acid, lithium salt (9CI) (CA INDEX NAME)



Li

L21 ANSWER 6 OF 42 HCAPLUS COPYRIGHT 2001 ACS
 AN 2001:221904 HCAPLUS
 DN 134:225104
 TI Electrochemical batteries with restricted liquid electrolyte volume
 IN Wessel, Silvia A.; Almond, Katherine P.
 PA Eagle-Picher Energy Products Corporation, Can.
 SO U.S., 16 pp.
 CODEN: USXXAM
 DT Patent
 LA English
 IC ICM H01M002-00
 NCL 429163000
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6207318	B1	20010327	US 1998-102436	19980622
AB	In a flexible nonaq. electrochem. cell , the electrolyte resides substantially entirely within the porous anode , cathode , and separator. In manufg. the flexible nonaq. electrochem. cell , the vol. within the cell available to receive the electrolyte is substantially limited to the pores of the anode , cathode , and separator.				
ST	battery restricted liq electrolyte vol				
IT	Alloys, uses RL: DEV (Device component use); USES (Uses) (alk. earth; electrochem. batteries with restricted liq. electrolyte vol.)				
IT	Alloys, uses RL: DEV (Device component use); USES (Uses) (alkali metal; electrochem. batteries with restricted liq. electrolyte vol.)				
IT	Alkali metals, uses Alkaline earth metals RL: DEV (Device component use); USES (Uses) (alloys; electrochem. batteries with restricted liq. electrolyte vol.)				
IT	Fluoropolymers, uses RL: TEM (Technical or engineered material use); USES (Uses) (binder; electrochem. batteries with restricted liq. electrolyte vol.)				
IT	Battery electrolytes Primary batteries Secondary batteries (electrochem. batteries with restricted liq. electrolyte vol.)				
IT	Alkali metals, uses Alkaline earth metals RL: DEV (Device component use); USES (Uses) (electrochem. batteries with restricted liq. electrolyte vol.)				
IT	Hydrocarbons, uses				

RL: TEM (Technical or engineered material use); USES (Uses)
(fluoro, binder; electrochem. batteries with restricted liq.
electrolyte vol.)

IT Oxides (inorganic), uses
Sulfides, uses
Transition metal oxides

RL: MOA (Modifier or additive use); USES (Uses)
(lithiated; electrochem. batteries with restricted liq. electrolyte
vol.)

IT 9002-84-0, Ptfе 24937-79-9, Pvdф

RL: TEM (Technical or engineered material use); USES (Uses)
(binder; electrochem. batteries with restricted liq. electrolyte vol.)

IT 108-32-7, Propylene carbonate 109-99-9, Thf, uses 110-71-4
1313-13-9, Manganese dioxide, uses 1314-35-8, Tungsten oxide, uses
1344-70-3, Copper oxide 7429-90-5, Aluminum, uses 7439-93-2, Lithium,
uses 7440-44-0D, Carbon, lithiated 7791-03-9, Lithium perchlorate
9003-07-0, Polypropylene 11099-11-9, Vanadium oxide 11115-78-9, Copper
sulfide 11118-57-3, Chromium oxide 11126-12-8, Iron sulfide
11129-60-5, Manganese oxide 11130-24-8, Vanadium sulfide 12612-50-9,
Molybdenum sulfide 14283-07-9, Lithium tetrafluoroborate 29935-35-1,
Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 39448-96-9,
Graphite lithium 90076-65-6 **132404-42-3**

RL: DEV (Device component use); USES (Uses)
(electrochem. batteries with restricted liq. electrolyte vol.)

IT 105-58-8, Diethyl carbonate 616-38-6, Dimethyl carbonate 623-53-0,
Ethyl methyl carbonate 7440-44-0, Carbon, uses 39300-70-4, Lithium
nickel oxide 39457-42-6, Lithium manganese oxide 52627-24-4, Cobalt
lithium oxide

RL: MOA (Modifier or additive use); USES (Uses)
(electrochem. batteries with restricted liq. electrolyte vol.)

IT 7440-42-8, Boron, uses 7723-14-0, Phosphorus, uses 7727-37-9,
Nitrogen, uses

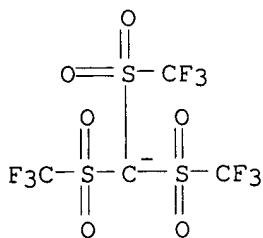
RL: MOA (Modifier or additive use); USES (Uses)
(lithiated carbon doped with; electrochem. batteries with restricted
liq. electrolyte vol.)

RE.CNT 22

RE

- (1) Almond; Pouch Papers, 38th Power Sources Conference 1998, P131 HCAPLUS
- (2) Amoroso; US 5531601 1996
- (3) Brocksmith; US 5197994 1993
- (4) Chi; US 5750282 1998 HCAPLUS
- (5) Christopher; Proceedings of the Power Sources Conference (37th) 1996
- (6) Cipriano; US 4877695 1989 HCAPLUS
- (7) Clayman; US 3990917 1976
- (8) Decker; US 4061163 1977
- (9) Dey; US 4092464 1978 HCAPLUS
- (10) Epstein; US 4507857 1985 HCAPLUS
- (11) Evans; US 4289176 1981
- (12) Hines; US 3663796 1972
- (13) Hoge; 5th Proceedings of the Workshop for Battery Exploratory Development
1997, P336
- (14) Hughett; US 5588970 1996
- (15) Lake; US 5326652 1994
- (16) Malinovsky; Pouch Papers, 38th Power Sources Conference 1998, P135 HCAPLUS
- (17) Marcoux; 5th Proceedings of the Workshop for Battery Exploratory
Development 1997, P6
- (18) Rao; US 4695519 1987
- (19) Rodriguez; US 5667909 1997
- (20) Simonton; US 4505996 1985 HCAPLUS
- (21) Uline; US 3675389 1972
- (22) Vogel; US 5212867 1993

IT 132404-42-3
 RL: DEV (Device component use); USES (Uses)
 (electrochem. batteries with restricted liq. electrolyte vol.)
 RN 132404-42-3 HCAPLUS
 CN Methane, tris[(trifluoromethyl)sulfonyl]-, ion(1-), lithium (9CI) (CA
 INDEX NAME)



● Li⁺

L21 ANSWER 7 OF 42 HCAPLUS COPYRIGHT 2001 ACS
 AN 2001:210246 HCAPLUS
 DN 134:240123
 TI Secondary batteries with **nonaqueous** electrolytes
 IN Oshita, Ryuji; Kusumoto, Yasuyuki; Fujimoto, Masahisa
 PA Sanyo Electric Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 9 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM H01M010-40
 ICS H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001076756	A2	20010323	JP 1999-247560	19990901
OS	MARPAT 134:240123				
AB	The batteries comprise cathode (collector) and anode (collector) both having graphitic carbon surface layer and a nonaq. electrolyte contg. ethylene carbonate and chain-type carbonates as solvents. The electrolyte may also contain .gtoreq.1 of LiPF ₆ , LiBF ₄ , LiAsF ₆ , LiSbF ₆ , LiClO ₄ , and/or LiX(SO ₂) _n (X = N, C, O, B; R = CF ₃ , C ₂ F ₅ , C ₃ F ₇ , C ₄ F ₉ ; n = integer of 1-3). Ta may be used as the cathode collector. Batteries with resistance to overcharging are obtained.				
ST	nonaq electrolyte secondary battery overcharging resistance; ethylene carbonate electrolyte secondary battery; chain type carbonate electrolyte secondary battery; lithium salt electrolyte secondary battery; graphitic carbon coating secondary battery electrode				
IT	Secondary batteries (nonaq. ; secondary batteries with resistance to overcharging comprising of graphitic carbon-coated electrodes and nonaq. electrolytes contg. ethylene carbonate and chain-type carbonates)				
IT	Battery electrodes Battery electrolytes (secondary batteries with resistance to overcharging comprising of graphitic carbon-coated electrodes and nonaq. electrolytes)				

contg. ethylene carbonate and chain-type carbonates)

IT 7429-90-5, Aluminum, uses 7440-25-7, Tantalum, uses
 RL: DEV (Device component use); USES (Uses)
 (cathode collector; secondary batteries with resistance to overcharging
 comprising of graphitic carbon-coated electrodes and **nonaq.**
 electrolytes contg. ethylene carbonate and chain-type carbonates)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 616-38-6,
 Dimethyl carbonate
 RL: DEV (Device component use); USES (Uses)
 (electrolyte solvent; secondary batteries with resistance to
 overcharging comprising of graphitic carbon-coated electrodes and
nonaq. electrolytes contg. ethylene carbonate and chain-type
 carbonates)

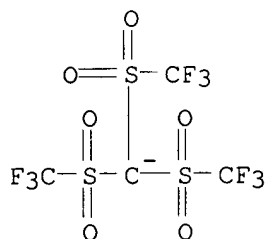
IT 7440-44-0, Carbon, uses
 RL: DEV (Device component use); USES (Uses)
 (graphitic; secondary batteries with resistance to overcharging
 comprising of graphitic carbon-coated electrodes and **nonaq.**
 electrolytes contg. ethylene carbonate and chain-type carbonates)

IT 7782-42-5, Graphite, uses 7791-03-9, Lithium perchlorate 14283-07-9,
 Lithium tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate
 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium
 hexafluoroarsenate 90076-65-6, Lithium bis(trifluoromethanesulfonyl)imid
 e 119229-99-1 **132404-42-3**, Lithium
 tris(trifluoromethylsulfonyl)methanide 132843-44-8, Lithium
 bis(pentafluoroethanesulfonyl)imide 176719-70-3
 RL: DEV (Device component use); USES (Uses)
 (secondary batteries with resistance to overcharging comprising of
 graphitic carbon-coated electrodes and **nonaq.** electrolytes
 contg. ethylene carbonate and chain-type carbonates)

IT **132404-42-3**, Lithium tris(trifluoromethylsulfonyl)methanide
 RL: DEV (Device component use); USES (Uses)
 (secondary batteries with resistance to overcharging comprising of
 graphitic carbon-coated electrodes and **nonaq.** electrolytes
 contg. ethylene carbonate and chain-type carbonates)

RN 132404-42-3 HCAPLUS

CN Methane, tris[(trifluoromethyl)sulfonyl]-, ion(1-), lithium (9CI) (CA
 INDEX NAME)



● Li⁺

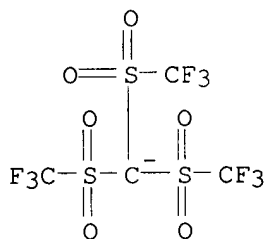
L21 ANSWER 8 OF 42 HCAPLUS COPYRIGHT 2001 ACS
 AN 2001:31798 HCAPLUS
 DN 134:103245
 TI **Nonaqueous** electrolyte lithium secondary batteries
 IN Doyle, Christopher Marc; Feiring, Andrew Edward; Bekiarian, Paul Gregory;
 Farnham, William Brown; Choi, Susan Kuharcik

PA E.I. du Pont de Nemours and Company, USA
 SO PCT Int. Appl., 27 pp.
 CODEN: PIXXD2
 DT Patent
 LA English
 IC ICM H01M010-40
 ICS H01M004-02
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 37

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001003230	A1	20010111	WO 2000-US17772	20000628
	W: AU, CA, CN, JP, KR, MX, US RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
PRAI	US 1999-142229	P	19990702		
OS	MARPAT 134:103245				
AB	This invention relates to electrolyte soln. compns. useful in lithium-ion batteries with electrode compn. comprising a Li electrolyte soln. in ionically conductive contact with a carbon-based electrode active material, wherein the soln. comprises a Li electrolyte and a solvent represented by R1C(O)OR2OC(O)R3 or R1OC(O)R2C(O)OR3, where R1 and R3 each independently designates an acyclic alkyl radical of 1-4 carbons, C(O) designates a carbonyl radical, and R2 is an alkenyl radical of 2 or 3 carbons. These electrolytes feature lower volatility than solns. known in the art while retaining excellent battery performance using graphite based neg. electrode active materials.				
ST	lithium secondary battery nonaq electrolyte				
IT	Fluoropolymers, uses RL: TEM (Technical or engineered material use); USES (Uses) (binder; nonaq. electrolyte lithium secondary batteries)				
IT	Fluoro rubber RL: TEM (Technical or engineered material use); USES (Uses) (hexafluoropropene-vinylidene fluoride; nonaq. electrolyte lithium secondary batteries)				
IT	Secondary batteries (lithium; nonaq. electrolyte lithium secondary batteries)				
IT	Battery electrolytes (nonaq. electrolyte lithium secondary batteries)				
IT	Carbon fibers, uses RL: DEV (Device component use); USES (Uses) (nonaq. electrolyte lithium secondary batteries)				
IT	Carbon black, uses RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses) (nonaq. electrolyte lithium secondary batteries)				
IT	7782-42-5, Graphite, uses RL: DEV (Device component use); USES (Uses) (mesocarbon microbeads; nonaq. electrolyte lithium secondary batteries)				
IT	94-60-0, Dimethyl 1,4-cyclohexanedicarboxylate 96-49-1, Ethylene carbonate 106-65-0, Dimethyl succinate 111-15-9, 2-Ethoxyethyl acetate 111-55-7, Ethylene glycol diacetate 1119-40-0, Dimethyl glutarate 7791-03-9, Lithium perchlorate 12190-79-3, Cobalt lithium oxide colio2 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 90076-65-6 132404-42-3 132843-44-8 214690-39-8 RL: DEV (Device component use); USES (Uses) (nonaq. electrolyte lithium secondary batteries)				
IT	55289-53-7P				

RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (nonaq. electrolyte lithium secondary batteries)
 IT 84-74-2, Dibutyl phthalate
 RL: TEM (Technical or engineered material use); USES (Uses)
 (plasticizer; nonaq. electrolyte lithium secondary batteries)
 RE.CNT 17
 RE
 (1) Anon; US 6117596 A 2000 HCAPLUS
 (2) Anon; PATENT ABSTRACTS OF JAPAN 1996, V1996(02)
 (3) Anon; PATENT ABSTRACTS OF JAPAN 1996, V1996(08)
 (4) Anon; PATENT ABSTRACTS OF JAPAN 1999, V1999(10)
 (5) Anon; PATENT ABSTRACTS OF JAPAN 1999, V1999(04)
 (6) Choi Susan Kuharcik; WO 9967304 A 1999 HCAPLUS
 (7) Danionics As; WO 9727635 A 1997 HCAPLUS
 (8) Du Pont; WO 9820573 A 1998 HCAPLUS
 (9) Fuji Photo Film Co Ltd; JP 07014610 A 1995 HCAPLUS
 (10) Johnson, L; WO 9931743 A 1999 HCAPLUS
 (11) Matsushita Denchi Kogyo Kk; JP 11026018 A 1999 HCAPLUS
 (12) Matsushita Electric Ind Co Ltd; JP 08096849 A 1996 HCAPLUS
 (13) Samsung Electron Co Ltd; JP 11135148 A 1999 HCAPLUS
 (14) Sony Corp; JP 07272756 A 1995 HCAPLUS
 (15) Sony Corp; JP 09097626 A 1997 HCAPLUS
 (16) Stanford Res Inst Int; WO 9621639 A 1996 HCAPLUS
 (17) Webber, A; US 5219683 A 1993 HCAPLUS
 IT 132404-42-3
 RL: DEV (Device component use); USES (Uses)
 (nonaq. electrolyte lithium secondary batteries)
 RN 132404-42-3 HCAPLUS
 CN Methane, tris[(trifluoromethyl)sulfonyl]-, ion(1-), lithium (9CI) (CA INDEX NAME)



● Li⁺

L21 ANSWER 9 OF 42 HCAPLUS COPYRIGHT 2001 ACS
 AN 2001:28738 HCAPLUS
 DN 134:88772
 TI **Nonaqueous** secondary lithium **battery** containing carbon fibers in the **anode**
 IN Yamaguchi, Akira; Omaru, Atsuo; Nagamine, Masayuki
 PA Sony Corporation, Japan
 SO Eur. Pat. Appl., 17 pp.
 CODEN: EPXXDW
 DT Patent
 LA English
 IC ICM H01M010-40

ICS H01M004-58; H01M004-62

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

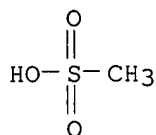
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1067615	A1	20010110	EP 2000-113696	20000628
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2001015170	A2	20010119	JP 1999-183607	19990629
	CN 1284758	A	20010221	CN 2000-122731	20000629
PRAI	JP 1999-183607	A	19990629		
AB	The title battery has improved cell characteristics at a low temp. The anode contains fiber carbon, which enables smooth doping and dedoping of lithium ions at a low temp. Accordingly, the internal resistance value at a low temp. is reduced and the cell capacity value is increased.				
ST	lithium battery anode carbon fiber				
IT	Fluoropolymers, uses				
	RL: TEM (Technical or engineered material use); USES (Uses)				
	(binder; nonaq. secondary lithium battery contg. carbon fibers in anode)				
IT	Secondary batteries				
	(lithium; nonaq. secondary lithium battery contg. carbon fibers in anode)				
IT	Battery anodes				
	Coal tar pitch				
	(nonaq. secondary lithium battery contg. carbon fibers in anode)				
IT	Carbon fibers, uses				
	RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)				
	(nonaq. secondary lithium battery contg. carbon fibers in anode)				
IT	24937-79-9, PvdF				
	RL: TEM (Technical or engineered material use); USES (Uses)				
	(binder; nonaq. secondary lithium battery contg. carbon fibers in anode)				
IT	96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate 1314-62-1, Vanadium pentoxide, uses 1317-33-5, Molybdenum sulfide mos2, uses 2550-62-1, Lithium methanesulfonate 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide 7782-42-5, Graphite, uses 7791-03-9, Lithium perchlorate 9003-07-0, Polypropylene 12039-13-3, Titanium sulfide tis2 12058-18-3, Molybdenum selenide mose2 12190-79-3, Cobalt lithium oxide colio2 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate 14485-20-2, Lithium tetraphenylborate 17347-95-4, Lithium hexafluorosilicate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 90076-65-6 132404-42-3				
	RL: DEV (Device component use); USES (Uses)				
	(nonaq. secondary lithium battery contg. carbon fibers in anode)				

RE.CNT 5

RE

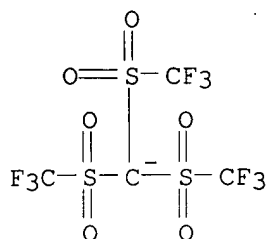
- (1) Abe, H; US 5856043 A 1999 HCAPLUS
 - (2) Matsushita Electric Ind Co Ltd; EP 0803926 A 1997 HCAPLUS
 - (3) Petoca Ltd; EP 0644603 A 1995 HCAPLUS
 - (4) Takeuchi, E; US 5443928 A 1995 HCAPLUS
 - (5) Toray Industries; EP 0817293 A 1998 HCAPLUS
- IT 2550-62-1, Lithium methanesulfonate **132404-42-3**
- RL: DEV (Device component use); USES (Uses)
- (nonaq. secondary lithium **battery** contg. carbon

fibers in **anode**)
 RN 2550-62-1 HCAPLUS
 CN Methanesulfonic acid, lithium salt (9CI) (CA INDEX NAME)



Li

RN 132404-42-3 HCAPLUS
 CN Methane, tris[(trifluoromethyl)sulfonyl]-, ion(1-), lithium (9CI) (CA INDEX NAME)



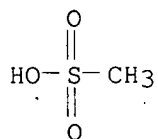
● Li⁺

L21 ANSWER 10 OF 42 HCAPLUS COPYRIGHT 2001 ACS
 AN 2001:1264 HCAPLUS
 DN 134:59141
 TI **Nonaqueous** electrolyte battery
 IN Hommura, Hayato; Imoto, Hiroshi; Nagamine, Masayuki
 PA Sony Corporation, Japan
 SO Eur. Pat. Appl., 10 pp.
 CODEN: EPXXDW
 DT Patent
 LA English
 IC ICM H01M010-40
 ICS H01M002-16
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1063720	A2	20001227	EP 2000-112794	20000616
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2001006747	A2	20010112	JP 1999-176007	19990622
	CN 1290973	A	20010411	CN 2000-118875	20000622
PRAI	JP 1999-176007	A	19990622		
AB	A nonaq. electrolyte secondary battery incorporating a pos. electrode contg. a pos.- electrode active material				

and a **neg. electrode** contg. a **neg.-electrode** active material which are laminated through a separator and contg. **nonaq.** electrolytic soln. enclosed therein, the **nonaq.** electrolyte secondary **battery** having a spinel manganese composite metal oxide serving as the pos.-**electrode** active material, wherein the separator is constituted by paper having a thickness of 15 .mu.m to 60 .mu.m and permeability of 1 s/100 CC to 10 s/100 CC.

ST battery **nonaq** electrolyte
 IT Battery anodes
 Conducting polymers
 Secondary batteries
 Secondary battery separators
 (**nonaq.** electrolyte battery)
 IT Carbonaceous materials (technological products)
 Oxides (inorganic), uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (**nonaq.** electrolyte battery)
 IT Lithium alloy, base
 RL: DEV (Device component use); USES (Uses)
 (**nonaq.** electrolyte battery)
 IT 7429-90-5, Aluminum, uses
 RL: DEV (Device component use); USES (Uses)
 (current collector; **nonaq.** electrolyte battery)
 IT 75-05-8, Acetonitrile, uses 79-20-9, Methyl acetate 96-47-9,
 2-Methyltetrahydrofuran 96-48-0, .gamma.-Butyrolactone 96-49-1,
 Ethylene carbonate 105-58-8, Diethyl carbonate 107-31-3, Methyl
 formate 108-32-7, Propylene carbonate 109-94-4, Ethyl formate
 109-99-9, Thf, uses 110-71-4, 1,2-Dimethoxyethane 126-33-0, Sulfolane
 141-78-6, Ethyl acetate, uses 616-38-6, Dimethyl carbonate 623-53-0,
 Ethylmethyl carbonate 629-14-1, 1,2-Diethoxyethane 646-06-0,
 1,3-Dioxolane **2550-62-1**, Lithium methanesulfonate 7439-93-2,
 Lithium, uses 7791-03-9, Lithium perchlorate 9004-34-6, Cellulose,
 uses 12057-17-9, Lithium manganese oxide LiMn_2O_4 14283-07-9, Lithium
 tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 29935-35-1,
 Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 35678-71-8,
 MethylSulfolane 90076-65-6
 RL: DEV (Device component use); USES (Uses)
 (**nonaq.** electrolyte battery)
 IT **2550-62-1**, Lithium methanesulfonate
 RL: DEV (Device component use); USES (Uses)
 (**nonaq.** electrolyte battery)
 RN 2550-62-1 HCAPLUS
 CN Methanesulfonic acid, lithium salt (9CI) (CA INDEX NAME)

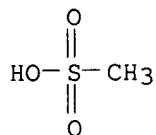


● Li

L21 ANSWER 11 OF 42 HCAPLUS COPYRIGHT 2001 ACS
 AN 2000:861126 HCAPLUS
 DN 134:7008

TI **Nonaqueous** electrolyte battery
 IN Yamaura, Kiyoshi
 PA Sony Corp., Japan
 SO Eur. Pat. Appl., 12 pp.
 CODEN: EPXXDW
 DT Patent
 LA English
 IC ICM H01M004-48
 ICS H01M004-50
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1058325	A2	20001206	EP 2000-111667	20000531
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2000348722	A2	20001215	JP 1999-158355	19990604
PRAI	JP 1999-158355	A	19990604		
AB	A nonaq. electrolyte battery free from considerable change in the structure of a cathode active material thereof to enlarge the capacity thereof, incorporating a cathode contg. a cathode active material; an anode contg. an anode active material to which Li can be doped/dedoped; and a nonaq. electrolyte disposed between the cathode and the anode and contg. nonaq. solvent and an electrolyte, wherein a material expressed by general formula $\text{LiMn}_{1-y}\text{Al}_y\text{O}_2$ ($0.06 \leq y < 0.25$) is contained as the cathode active material and $\text{LiMn}_{1-y}\text{Al}_y\text{O}_2$ has a cryst. structure expressed by spatial group C2/m.				
ST	nonaq electrolyte lithium battery; aluminum lithium manganese oxide cathode battery				
IT	Battery cathodes (aluminum lithium manganese oxide; nonaq. electrolyte battery)				
IT	Secondary batteries (lithium; nonaq. electrolyte battery)				
IT	Battery anodes (nonaq. electrolyte battery)				
IT	Lithium alloy, base RL: DEV (Device component use); USES (Uses) (nonaq. electrolyte battery)				
IT	60-29-7, Diethyl ether, uses 75-05-8, Acetonitrile, uses 96-47-9, 2-Methyltetrahydrofuran 96-48-0, γ -Butyrolactone 96-49-1, Ethylene carbonate 100-66-3, Anisole, uses 105-58-8, Diethyl carbonate 107-12-0, Propionitrile 109-99-9, Thf, uses 110-71-4, 1,2-Dimethoxyethane 126-33-0, Sulfolane 616-38-6, Dimethyl carbonate 629-14-1, 1,2-Diethoxyethane 646-06-0, 1,3-Dioxolane 1072-47-5, 4-Methyl-1,3-dioxolane 2550-62-1 , Lithium methanesulfonate 7439-93-2, Lithium, uses 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide 7791-03-9, Lithium perchlorate 14283-07-9, Lithium tetrafluoroborate 14485-20-2, Lithium tetraphenylborate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium trifluoromethanesulfonate 35678-71-8, Methylsulfolane 110320-40-6, Polypropylene carbonate RL: DEV (Device component use); USES (Uses) (nonaq. electrolyte battery)				
IT	2550-62-1 , Lithium methanesulfonate RL: DEV (Device component use); USES (Uses) (nonaq. electrolyte battery)				
RN	2550-62-1 HCAPLUS				
CN	Methanesulfonic acid, lithium salt (9CI) (CA INDEX NAME)				



Li

L21 ANSWER 12 OF 42 HCAPLUS COPYRIGHT 2001 ACS

AN 2000:686425 HCAPLUS

DN 133:240636

TI **Nonaqueous** electrolyte battery

IN Tomita, Takashi; Ojima, Hideaki; Ishino, Kinichi; Kondo, Takayuki

PA Sony Corporation, Japan

SO Eur. Pat. Appl., 11 pp.

CODEN: EPXXDW

DT Patent

LA English

IC ICM H01M004-02

ICS H01M004-62; H01M004-58; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1039567	A1	20000927	EP 2000-106324	20000323
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2000277157	A2	20001006	JP 1999-82375	19990325
PRAI	JP 1999-82375	A	19990325		
AB	A nonaq. electrolyte battery having improved low temp. characteristics and preservation characteristics includes a neg. electrode contg. a carbon material as a neg. electrode active material, a pos. electrode contg. a pos. electrode active material and which is arranged facing the neg. electrode and a nonaq. electrolyte arranged between the neg. and pos. electrodes. The neg. electrode contains a material not doped with lithium and/or not releasing lithium in an amt. of not less than 20 wt% and not larger than 40 wt% based on the neg. electrode active material.				
ST	lithium battery nonaq electrolyte				
IT	Carboxylic acids, uses RL: DEV (Device component use); USES (Uses) (esters; nonaq. electrolyte battery with improved low-temp. characteristics)				
IT	Battery anodes Battery electrolytes Primary batteries (nonaq. electrolyte battery with improved low-temp. characteristics)				
IT	Carbonaceous materials (technological products) Ethers, uses RL: DEV (Device component use); USES (Uses) (nonaq. electrolyte battery with improved low-temp. characteristics)				
IT	Rare earth oxides RL: DEV (Device component use); MOA (Modifier or additive use); USES				

(Uses)
 (nonaq. electrolyte battery with improved low-temp. characteristics)

IT Fluoropolymers, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (nonaq. electrolyte battery with improved low-temp. characteristics)

IT Petroleum pitch
 (precursor; nonaq. electrolyte battery with improved low-temp. characteristics)

IT 463-79-6D, Carbonic acid, esters
 RL: DEV (Device component use); USES (Uses)
 (cyclic and chain; nonaq. electrolyte battery with improved low-temp. characteristics)

IT 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate 7782-42-5, Graphite, uses 7791-03-9, Lithium perchlorate 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate 17347-95-4, Lithium hexafluorosilicate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 90076-65-6
132404-42-3
 RL: DEV (Device component use); USES (Uses)
 (nonaq. electrolyte battery with improved low-temp. characteristics)

IT 1305-78-8, Calcia, uses 1309-48-4, Magnesia, uses 1314-11-0, Strontia, uses 1314-23-4, Zirconium oxide, uses 1314-36-9, Yttria, uses 1344-28-1, Alumina, uses 1345-13-7, Cerium oxide Ce_2O_3 7631-86-9, Silica, uses 10034-77-2, Calcium silicate Ca_2SiO_4 12141-46-7, Aluminum silicate Al_2SiO_5
 RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
 (nonaq. electrolyte battery with improved low-temp. characteristics)

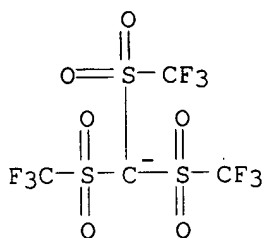
IT 12190-79-3P, Cobalt lithium oxide CoLiO_2
 RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (nonaq. electrolyte battery with improved low-temp. characteristics)

IT 24937-79-9, PvdF
 RL: TEM (Technical or engineered material use); USES (Uses)
 (nonaq. electrolyte battery with improved low-temp. characteristics)

RE.CNT 4
 RE
 (1) Anon; PATENT ABSTRACTS OF JAPAN 1998, V1998(12)
 (2) Hitachi, M; EP 0845825 A 1998 HCAPLUS
 (3) Sanyo Electric Co Ltd; JP 10188957 A 1998 HCAPLUS
 (4) Sony Corp; JP 07111161 A 1995 HCAPLUS

IT **132404-42-3**
 RL: DEV (Device component use); USES (Uses)
 (nonaq. electrolyte battery with improved low-temp. characteristics)

RN 132404-42-3 HCAPLUS
 CN Methane, tris[(trifluoromethyl)sulfonyl]-, ion(1-), lithium (9CI) (CA INDEX NAME)



● Li⁺

L21 ANSWER 13 OF 42 HCAPLUS COPYRIGHT 2001 ACS

AN 2000:608508 HCAPLUS

DN 133:196016

TI Cobalt-based alloys as cathode current collectors in **nonaqueous** electrochemical cells

IN Frysz, Christine A.; Smesko, Sally A.; Kreidler, Peter A.; Brown, W. Richard; Takeuchi, Esther S.

PA Wilson Greatbatch Ltd., USA

SO Eur. Pat. Appl., 26 pp.

CODEN: EPXXDW

DT Patent

LA English

IC ICM H01M004-66

ICS C22C019-07

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 55, 56

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1032063	A1	20000830	EP 2000-301434	20000223
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2000251898	A2	20000914	JP 2000-49516	20000225

PRAI US 1999-257795 A 19990225

AB Cobalt-based alloys are provided for use as a pos. **electrode** current collector in a solid **cathode**, **nonaq.** liq. electrolyte, alkali metal **anode** active **electrochem.** cell. The cobalt-based alloys are characterized by chem. compatibility with aggressive cell environments, high corrosion resistance and resistance to fluorination and passivation at elevated temps., thus improving the longevity and performance of the electrochem. cell. The battery can be of either a primary or a secondary configuration.

ST **battery cathode** current collector cobalt based alloy

IT **Battery** cathodes
(cobalt-based alloys as **cathode** current collectors in **nonaq.** electrochem. cells)

IT Alkali metal compounds
Alkali metals, uses
Alkaline earth metals
Carbonaceous materials (technological products)
Group IIIB elements

RL: DEV (Device component use); USES (Uses)
(cobalt-based alloys as cathode current collectors in **nonaq.** electrochem. cells)

IT 7429-90-5, Aluminum, uses 7439-91-0, Lanthanum, uses 7439-96-5,

Manganese, uses 7440-21-3, Silicon, uses 7440-25-7, Tantalum, uses 7440-32-6, Titanium, uses 7440-41-7, Beryllium, uses 7440-67-7, Zirconium, uses 7704-34-9, Sulfur, uses
RL: DEV (Device component use); USES (Uses)

(alloy contg.; cobalt-based alloys as cathode current collectors in nonaq. electrochem. cells)

IT 67-68-5, DmsO, uses 68-12-2, Dmf, uses 75-05-8, Acetonitrile, uses 79-20-9, Methyl acetate 96-48-0, .gamma.-Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-20-3, Diisopropyl ether 108-29-2, .gamma.-Valerolactone 108-32-7, Propylene carbonate 109-99-9, Thf, uses 110-71-4, 1,2-Dimethoxyethane 111-96-6, Diglyme 112-49-2, Triglyme 127-19-5, Dimethyl acetamide 143-24-8, Tetraglyme 556-65-0, Lithium thiocyanate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 623-96-1, Dipropyl carbonate 629-14-1, 1,2-Diethoxyethane 872-50-4, uses 1313-13-9, Manganese dioxide, uses 1313-99-1, Nickel oxide, uses 1344-70-3, Copper oxide 2923-17-3 2923-20-8 3889-75-6, Carbon monofluoride 4437-85-8, Butylene carbonate 5137-45-1, 1-Ethoxy-2-methoxyethane 7439-93-2, Lithium, uses 7440-42-8, Boron, uses 7440-44-0, Carbon, uses 7723-14-0, Phosphorus, uses 7782-42-5, Graphite, uses 7791-03-9, Lithium perchlorate 8049-15-8, Elgiloy 11099-11-9, Vanadium oxide 11104-61-3, Cobalt oxide 11105-02-5, Silver vanadium oxide 11115-78-9, Copper sulfide 11126-12-8, Iron sulfide 12031-65-1, Lithium nickel oxide linio2 12039-13-3, Titanium disulfide 12057-17-9, Lithium manganese oxide limn2o4 12057-24-8, Lithia, uses 12068-85-8, Iron disulfide 12190-79-3, Cobalt lithium oxide colio2 12605-92-4, L-605 12646-94-5, MP35N 12789-09-2, Copper vanadium oxide 12798-95-7 13453-75-3, Lithium fluorosulfonate 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate 14485-20-2, Lithium tetraphenylborate 15955-98-3, Lithium tetrachlorogallate 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 35363-40-7, Ethyl propyl carbonate 37286-22-9, Havar 51311-17-2, Carbon fluoride 56525-42-9, Methyl propyl carbonate 68467-51-6, Haynes 556 90076-65-6 115028-88-1 131344-56-4, Cobalt lithium nickel oxide 132404-42-3 139658-36-9, Ultimet 181183-66-4, Copper silver vanadium oxide 256650-80-3, Cobalt lithium tin oxide Co0.92LiSn0.08O2 289045-19-8 289045-20-1 289045-21-2 289045-22-3 289045-23-4
RL: DEV (Device component use); USES (Uses)

(cobalt-based alloys as cathode current collectors in nonaq. electrochem. cells)

RE.CNT 7

RE

- (1) Asea, B; DE 4016157 A 1990 HCAPLUS
- (2) Ebel, S; US 4830940 A 1989 HCAPLUS
- (3) Frysz, C; US 5114810 A 1992 HCAPLUS
- (4) Hornung, R; WO 9833224 A 1998 HCAPLUS
- (5) Jaklovsky; DATABASE REGISTRY FILE
- (6) Jaklovsky; PREP NUCL TARGETS PART ACCEL, PROC WORLD CONF INT NUCL TARGET DEV SOC 1981
- (7) Skaggs; 1982, 4, HCAPLUS

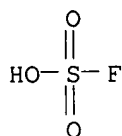
IT 13453-75-3, Lithium fluorosulfonate 132404-42-3

RL: DEV (Device component use); USES (Uses)

(cobalt-based alloys as cathode current collectors in nonaq. electrochem. cells)

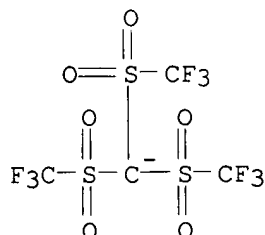
RN 13453-75-3 HCAPLUS

CN Fluorosulfuric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



Li

RN 132404-42-3 HCAPLUS
CN Methane, tris[(trifluoromethyl)sulfonyl]-, ion(1-), lithium (9CI) (CA INDEX NAME)



● Li⁺

L21 ANSWER 14 OF 42 HCAPLUS COPYRIGHT 2001 ACS
AN 1999:677692 HCAPLUS
DN 131:260026
TI **Nonaqueous** electrochemical cell containing conjugated polyimine functionality coupled to sulfur trioxide
IN Gilmour, Robin Alexander Angus
PA Lexcel Technology Ltd., UK
SO Brit. UK Pat. Appl., 13 pp.
CODEN: BAXXDU
DT Patent
LA English
IC ICM H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	GB 2335073	A1	19990908	GB 1998-4958	19980307
AB	A rechargeable Li battery has the cathode composed of conductive polymeric material having conjugated imine functionality and the Li salt of a sulfur oxy-acid as the active redox component. On charging, Li is electrochem. split from the salt, e.g., Li ₂ SO ₃ , and is deposited at the anode , the imine sites at the cathode acting as the host for SO ₃ complex formation. The system is optimized when the N content of the polyimine host material is present in an equimolar ratio with SO ₃ .				
ST	lithium battery conjugated polyimine sulfur trioxide				
IT	Fluoropolymers, uses				
RL:	TEM (Technical or engineered material use); USES (Uses)				

(binder; **nonaq.** electrochem. cell contg. conjugated polyimine
functionality coupled to sulfur trioxide)

IT Secondary batteries
(lithium; **nonaq.** battery contg. conjugated polyimine
functionality coupled to sulfur trioxide)

IT Battery cathodes
(**nonaq.** battery contg. conjugated polyimine functionality
coupled to sulfur trioxide)

IT Capacitors
(super or ultra-; **nonaq.** electrochem. cell contg. conjugated
polyimine functionality coupled to sulfur trioxide)

IT 24937-79-9
RL: TEM (Technical or engineered material use); USES (Uses)
(binder; **nonaq.** electrochem. cell contg. conjugated polyimine
functionality coupled to sulfur trioxide)

IT 7439-93-2, Lithium, uses 7439-95-4, Magnesium, uses 7446-09-5, Sulfur
dioxide, uses 25084-84-8, Polycyanoacetylene 28376-56-9 95991-23-4,
Polybipyrzazine
RL: DEV (Device component use); USES (Uses)
(**nonaq.** battery contg. conjugated polyimine functionality
coupled to sulfur trioxide)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate
13453-87-7, DiLithium sulfite 21324-40-3, Lithium
hexafluorophosphate
RL: DEV (Device component use); USES (Uses)
(**nonaq.** electrochem. cell contg. conjugated polyimine
functionality coupled to sulfur trioxide)

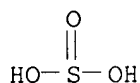
IT 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses
RL: DEV (Device component use); MOA (Modifier or additive use); USES
(Uses)
(**nonaq.** electrochem. cell contg. conjugated polyimine
functionality coupled to sulfur trioxide)

IT 25014-41-9, Polyacrylonitrile 26836-60-2, Acrylonitrile-2-vinylpyridine
copolymer 32236-74-1, Acrylonitrile-4-vinylpyridine copolymer
180082-35-3, Acrylonitrile-fumaronitrile copolymer
RL: DEV (Device component use); USES (Uses)
(thermally restructured; **nonaq.** battery contg. conjugated
polyimine functionality coupled to sulfur trioxide)

IT **13453-87-7**, DiLithium sulfite
RL: DEV (Device component use); USES (Uses)
(**nonaq.** electrochem. cell contg. conjugated polyimine
functionality coupled to sulfur trioxide)

RN 13453-87-7 HCAPLUS

CN Sulfurous acid, dilithium salt (8CI, 9CI) (CA INDEX NAME)



2 Li

L21 ANSWER 15 OF 42 HCAPLUS COPYRIGHT 2001 ACS
AN 1999:597566 HCAPLUS
DN 131:202278
TI **Nonaqueous**-electrolyte secondary battery
IN Yamaguchi, Akira

PA Sony Corporation, Japan
 SO Eur. Pat. Appl., 21 pp.
 CODEN: EPXXDW
 DT Patent
 LA English
 IC ICM H01M010-40
 ICS H01M010-04
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 942484	A1	19990915	EP 1999-104615	19990309
	EP 942484	B1	20010516		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 11260415	A2	19990924	JP 1998-57968	19980310
	CN 1228625	A	19990915	CN 1999-103957	19990310
PRAI	JP 1998-57968	A	19980310		

AB A **nonaq.**-electrolyte secondary **battery** includes a coil **electrode** formed by laminating an elongated **cathode** having a **cathode-mix** layer formed on at least either of main surfaces of a **cathode** collector and an elongated **anode** having an **anode-mix** layer formed on at least either main surfaces of an **anode** collector and by winding a laminate such that the **cathode** is positioned at the outermost position, wherein the **cathode-mix** layer is formed on only either of main surfaces of the collector at the position adjacent to the outermost end of the **cathode** and/or the position adjacent to the innermost end of the **cathode**, the **cathode-mix** layer is not formed on the **cathode** collector at the outermost end of the **cathode** and only the **cathode** collector is formed, the **anode-mix** layer is not formed on the **anode** collector at the outermost end of the **anode** and only the **anode** collector is formed, and the outermost end of the **anode** collector positioned at the outermost end of the **anode** is, in the direction from the inner portion of the coil **electrode** toward the outer portion, positioned more forwards than the outermost end of the **cathode** collector.

ST battery **nonaq** electrolyte

IT Petroleum pitch
 (**anode** precursor; **nonaq.**-electrolyte secondary **battery**)

IT Coke
 RL: DEV (Device component use); USES (Uses)
 (**anodes**; **nonaq.**-electrolyte secondary **battery**)

IT Fluoropolymers, uses
 RL: TEM (Technical or engineered material use); USES (Uses)
 (**binder**; **nonaq.**-electrolyte secondary **battery**)

IT Battery anodes
 Battery cathodes
 Battery electrolytes
 Secondary batteries
 (**nonaq.**-electrolyte secondary **battery**)

IT 7440-50-8, Copper, uses
 RL: DEV (Device component use); USES (Uses)
 (**anode** current collector; **nonaq.**-electrolyte secondary **battery**)

IT 24937-79-9, Polyvinylidene fluoride
 RL: TEM (Technical or engineered material use); USES (Uses)
 (**binder**; **nonaq.**-electrolyte secondary **battery**)

IT 7429-90-5, Aluminum, uses 7440-02-0, Nickel, uses 12597-68-1,

Stainless steel, uses

RL: DEV (Device component use); USES (Uses)

(cathode current collector; **nonaq.**-electrolyte secondary battery)

IT 12003-67-7, Aluminum lithium oxide alio2 12022-46-7, Iron lithium oxide felio2 12031-65-1, Lithium nickel oxide linio2 12057-19-1, Lithium titanium oxide litio2 12162-79-7, Lithium manganese oxide limno2 12162-87-7, Lithium vanadium oxide livo2 12190-79-3, Cobalt lithium oxide colio2

RL: DEV (Device component use); USES (Uses)

(cathodes; **nonaq.**-electrolyte secondary battery)

IT 60-29-7, Diethyl ether, uses 75-05-8, Acetonitrile, uses 96-48-0, .gamma.-Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethylcarbonate 107-12-0, Propionitrile 108-32-7, Propylene carbonate 109-99-9, Tetrahydrofuran, uses 110-71-4, 1,2-Dimethoxyethane 126-33-0, Sulfolane 629-14-1, 1,2-Diethoxyethane 646-06-0, 1,3-Dioxolane 1072-47-5, 4-Methyl-1,3-dioxolane 2550-62-1, Lithium methanesulfonate 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide 7791-03-9, Lithium perchlorate 14283-07-9, Lithium tetrafluoroborate 14485-20-2, Lithium tetraphenylborate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium trifluoromethanesulfonate 35678-71-8, Methylsulfolane

RL: DEV (Device component use); USES (Uses)

(**nonaq.**-electrolyte secondary battery)

IT 9002-88-4, Polyethylene 9003-07-0, Polypropylene

RL: DEV (Device component use); USES (Uses)

(separator; **nonaq.**-electrolyte secondary battery)

RE.CNT 5

RE

(1) Asahi Chemical Ind; EP 0780920 A 1997 HCAPLUS

(2) Michel, D; US 5360684 A 1994 HCAPLUS

(3) Satoshi, H; US 5508122 A 1996 HCAPLUS

(4) Sony Corp; JP 05234620 A 1993 HCAPLUS

(5) Toshiba Corp; JP 62272471 A 1987 HCAPLUS

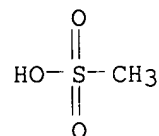
IT 2550-62-1, Lithium methanesulfonate

RL: DEV (Device component use); USES (Uses)

(**nonaq.**-electrolyte secondary battery)

RN 2550-62-1 HCAPLUS

CN Methanesulfonic acid, lithium salt (9CI) (CA INDEX NAME)



● Li

L21 ANSWER 16 OF 42 HCAPLUS COPYRIGHT 2001 ACS

AN 1999:557786 HCAPLUS

DN 131:159776

TI Lithium secondary battery and liquid electrolyte for the battery

IN Arai, Juichi

PA Hitachi, Ltd., Japan

SO Eur. Pat. Appl., 40 pp.

CODEN: EPXXDW

DT Patent

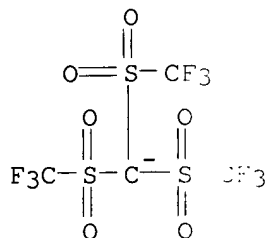
LA English

IC ICM H01M010-40

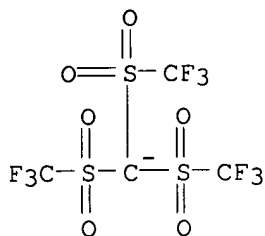
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 938151	A2	19990825	EP 1999-102731	19990219
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 11307123	A2	19991105	JP 1999-36818	19990216
	US 6210835	B1	20010403	US 1999-253136	19990219
	US 2001010377	A1	20010802	US 2001-799122	20010306
PRAI	JP 1998-38333	A	19980220		
	US 1999-253136	A3	19990219		
OS	MARPAT 131:159776				
AB	A lithium secondary battery comprises an anode, a cathode, a separator and a nonaq. liq. electrolyte. The nonaq. liq. electrolyte has an elec. cond. of 0.05 mS/cm or more and no such a flash point as specified by JIS-K2265 flash point test and comprises an ion nonconductive solvent and a lithium ion conductive solvent, is non-flammable and safe even at high temps.				
ST	lithium secondary battery nonaq electrolyte				
IT	Secondary batteries (lithium; nonaq. liq. electrolyte for lithium secondary battery)				
IT	Battery electrolytes (nonaq. liq. electrolyte for lithium secondary battery)				
IT	105-58-2, Diethyl carbonate 110-71-4 111-96-6, Diglyme 112-49-2, Triglyme 516-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 7447-41-9, Lithium chloride, uses 7550-35-8, Lithium bromide 7789-24-1, Lithium fluoride, uses 10377-51-2, Lithium iodide 14283-07-2, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 56525-42-9, Methyl propyl carbonate 90076-65-6 132404-41-3 132843-44-8 156783-95-8 163702-05-4, Hfe 7200 176719-11-3 190331-06-7 210406-60-3 219484-64-7, Hfe 7100 237390-11-3 RL: DEV (Device component use); USES (Uses) (nonaq. liq. electrolyte for lithium secondary battery)				
IT	132404-41-3 210406-60-3 RL: DEV (Device component use); USES (Uses) (nonaq. liq. electrolyte for lithium secondary battery)				
RN	132404-41-3 HCAPLUS				
CN	Methane, tris[(trifluoromethyl)sulfonyl]-, ion(1-), lithium (9CI) (CA INDEX E-1)				

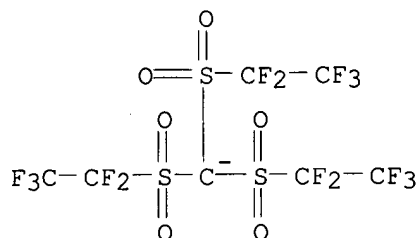


Li⁺



● Li⁺

RN 210406-60-3 HCAPLUS
 CN Ethane, 1,1',1''-[methylidynetris(sulfonyl)]tris[1,1,2,2,2-pentafluoro-,
 ion(1-), lithium (9CI) (CA INDEX NAME)



● Li⁺

L21 ANSWER 17 OF 42 HCAPLUS COPYRIGHT 2001 ACS
 AN 1999:464143 HCAPLUS
 DN 131:90263
 TI Asymmetric organic alkyl ethyl carbonates for **nonaqueous** power
 sources
 IN Ein-Eli, Yair; Laura, Richard
 PA Covalent Associates, Inc., USA
 SO PCT Int. Appl., 24 pp.
 CODEN: PIXXD2
 DT Patent
 LA English
 IC ICM H01G009-02
 ICS H01G009-00; H01G005-38; H01M004-50; H01M010-44
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9934381	A1	19990708	WO 1998-US27641	19981229
	W: JP				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL,				
	PT, SE				
	US 5986879	A	19991116	US 1997-1683	19971231
	EP 1042770	A1	20001011	EP 1998-964954	19981229
	R: DE				

PRAI US 1997-1683 A 19971231
 WO 1998-US27641 W 19981229

AB Acyclic, asym. Et alkyl carbonates (particularly for use with a carbonaceous, e.g., graphite, anode) in electrolytes suitable for portable power sources, e.g., electrolytes included in separator of **electrochem. cell** are disclosed. Asym. alkyl carbonates having the general structural formula $\text{EtO-CO}_2\text{R}$, where R is larger than Et, and most preferably equal to Bu, iso-Bu or sec-Bu, are particularly useful in causing the f.p. of the electrolytes of battery in which they are used to decrease dramatically, thus providing the key to low temp., high cycle life and high capacity for portable power sources.

ST battery electrolyte org alkyl ethyl carbonate

IT Battery electrolytes
 Capacitors
 (asym. org. alkyl Et carbonates for **nonaq.** power sources)

IT Secondary batteries
 (lithium; asym. org. alkyl Et carbonates for **nonaq.** power sources)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 4437-85-8, Butylene carbonate 7782-42-5, Graphite, uses 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 30714-78-4, Butyl ethyl carbonate 35363-40-7, Ethyl propyl carbonate 35363-42-9, Carbonic acid, ethyl isobutyl ester 61097-74-3 90076-65-6, Lithium bis(trifluoromethanesulfonyl)imide **132404-42-3** 143314-16-3, 1-Ethyl-3-methylimidazolium tetrafluoroborate 155371-19-0, 1-Ethyl-3-methylimidazolium hexafluorophosphate 174899-82-2 199658-41-8
 RL: DEV (Device component use); USES (Uses)
 (asym. org. alkyl Et carbonates for **nonaq.** power sources)

RE.CNT 3

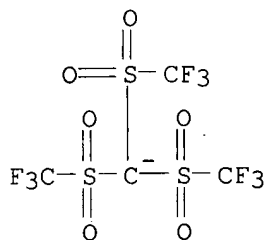
RE

(1) Carlin; US 5552238 A 1996 HCAPLUS
 (2) Finkelstein; US 4189761 A 1980 HCAPLUS
 (3) Miyasaka; US 5869208 A 1999 HCAPLUS

IT **132404-42-3**
 RL: DEV (Device component use); USES (Uses)
 (asym. org. alkyl Et carbonates for **nonaq.** power sources)

RN 132404-42-3 HCAPLUS

CN Methane, tris[(trifluoromethyl)sulfonyl]-, ion(1-), lithium (9CI) (CA INDEX NAME)



● Li⁺

L21 ANSWER 18 OF 42 HCAPLUS COPYRIGHT 2001 ACS
 AN 1999:460492 HCAPLUS
 DN 131:90284

TI Flame-resistant organic electrolytes for **nonaqueous** secondary battery
 IN Usami, Kyohei; Ito, Miho; Kubota, Naohiro; Mashimo, Shinya
 PA Denso Corporation, Japan; Asahi Denka Kogyo Kabushiki Kaisha
 SO Fr. Demande, 19 pp.
 CODEN: FRXXBL
 DT Patent
 LA French
 IC ICM C09K021-12
 ICS H01M002-00
 ICA C07F009-02
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	FR 2772390	A1	19990618	FR 1998-15228	19981202
	FR 2772390	B1	20010302		
	JP 11233141	A2	19990827	JP 1998-342065	19981201
	US 6210840	B1	20010403	US 1998-201667	19981201
PRAI	JP 1997-331538	A	19971202		
OS	MARPAT 131:90284				

AB Flame-resistant electrolytes are described for use in secondary batteries, esp. secondary lithium batteries with high energy d., comprising an org. solvent contg. a salt and 5-100 wt.% of a phosphonate or phosphinate of general formula (R1)_nP:O(OR2)_m, where R1 is C1-8-alkyl, alkyl halide, aryl, aralkyl, or -CH2COOR3 (R3 is C1-8-alkyl or alkyl halide); R2 is Me, Et, C1-8-alkyl halide; m,n=1,2; m+n=3. The org. solvents can be carbonates (e.g., ethylene carbonate and di-Et carbonate), lactones, ethers, sulfolanes or dioxolanes and the salts can be LiPF6, LiBF4, LiClO4, LiAsF6, LiSO3CF3, LiN(CF3SO2)2, LiC(CF3SO2)3.

ST electrolyte flame resistant **nonaq** secondary battery; battery secondary nonflammable **nonaq** electrolyte; lithium secondary battery nonflammable **nonaq** electrolyte; safety nonflammable secondary battery electrolyte

IT Secondary batteries
 (lithium; nonflammable org. electrolytes for **nonaq.** secondary battery)

IT Battery electrolytes
 Fire-resistant materials
 Safety
 Secondary batteries
 (nonflammable org. electrolytes for **nonaq.** secondary battery)

IT Fluoropolymers, uses
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (nonflammable org. electrolytes for **nonaq.** secondary battery)

IT Carbonates, uses
 Ethers, uses
 Lactones
 RL: NUU (Nonbiological use, unclassified); USES (Uses)
 (nonflammable org. electrolytes for **nonaq.** secondary battery)

IT Solvents
 (org.; nonflammable org. electrolytes for **nonaq.** secondary battery)

IT 7440-50-8, Copper, uses
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
 (anode; nonflammable org. electrolytes for **nonaq.** secondary battery)

IT 7429-90-5, Aluminum, uses 12190-79-3, Lithium cobalt oxide LiCoO2
 RL: DEV (Device component use); TEM (Technical or engineered material

use); USES (Uses)

(cathode; nonflammable org. electrolytes for **nonaq.**
secondary battery)

IT 872-50-4, N-Methyl-2-pyrrolidone, uses 7782-42-5, Graphite, uses
24937-79-9

RL: DEV (Device component use); TEM (Technical or engineered material
use); USES (Uses)

(nonflammable org. electrolytes for **nonaq.** secondary battery)

IT 649-68-3 650-16-8 683-08-9, Diethylmethane phosphonate 756-79-6,
Dimethylmethane phosphonate 757-95-9 867-13-0 2240-41-7,
Dimethylbenzene phosphonate 6163-75-3, Dimethylethane phosphonate
14337-77-0, Phosphinic acid, dimethyl-, methyl ester 71544-99-5
130522-75-7, Phosphonic acid, methylphenyl, Dimethyl ester 230310-88-0

RL: MOA (Modifier or additive use); USES (Uses)

(nonflammable org. electrolytes for **nonaq.** secondary battery)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 126-33-0,
Sulfolane 646-06-0, Dioxolane 7791-03-9 14283-07-9, Lithium
tetrafluoroborate LiBF₄ 21324-40-3, Lithium hexafluorophosphate LiPF₆
29935-35-1, Lithium hexafluoroarsenate LiAsF₆ 33454-82-9, Lithium
trifluoromethanesulfonate 90076-65-6, Lithium
bis(trifluoromethylsulfonyl)amide 132404-42-3, Lithium
tris(trifluoromethylsulfonyl)methanide

RL: NUU (Nonbiological use, unclassified); USES (Uses)

(nonflammable org. electrolytes for **nonaq.** secondary battery)

IT 9003-07-0, Polypropylene
RL: DEV (Device component use); TEM (Technical or engineered material
use); USES (Uses)

(separator; nonflammable org. electrolytes for **nonaq.**
secondary battery)

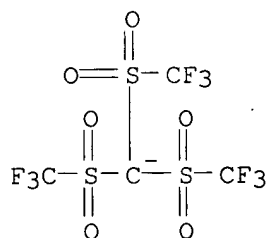
IT 132404-42-3, Lithium tris(trifluoromethylsulfonyl)methanide

RL: NUU (Nonbiological use, unclassified); USES (Uses)

(nonflammable org. electrolytes for **nonaq.** secondary battery)

RN 132404-42-3 HCAPLUS

CN Methane, tris[(trifluoromethyl)sulfonyl]-, ion(1-), lithium (9CI) (CA
INDEX NAME)



● Li⁺

L21 ANSWER 19 OF 42 HCAPLUS COPYRIGHT 2001 ACS

AN 1999:279825 HCAPLUS

DN 130:284502

TI Lithium ion battery electrolyte composition

IN Praas, Hans-Walter; Oberhauser, Johanna

PA Varta Geratebatterie G.m.b.H., Germany

SO Eur. Pat. Appl., 10 pp.

CODEN: EPXXDW

DT Patent
 LA German
 IC ICM H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 911901	A1	19990428	EP 1998-116148	19980827
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	DE 19747140	A1	19990429	DE 1997-19747140	19971024
	JP 11195431	A2	19990721	JP 1998-299766	19981021
	CA 2251068	AA	19990424	CA 1998-2251068	19981022
PRAI	DE 1997-19747140		19971024		
AB	A Li secondary battery with carbonaceous anode materials, a Li-contg. cathode material, and a nonaq. electrolyte has a Li salt soln. of ethylene carbonate 20-40, di-Et carbonate 15-30, and propylene carbonate 35-55 vol.%. The electrolyte is 0.9-2M LiClO ₄ , LiPF ₆ , LiSO ₃ CF ₃ , LiBF ₄ , LiN(CF ₃ SO ₂) ₂ or LiC(CF ₃ SO ₂) ₃ .				
ST	lithium battery electrolyte				
IT	Battery electrolytes				
	Lithium secondary batteries				
	(lithium ion battery electrolyte compn.)				
IT	7440-02-0, Nickel, uses				
	RL: DEV (Device component use); USES (Uses)				
	(foam; lithium ion battery electrolyte compn.)				
IT	96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 7791-03-9, Lithium perchlorate 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 33454-82-9, Lithium triflate 39457-42-6, Lithium manganese oxide 90076-65-6, Lithium bis(trifluoromethanesulfonyl)imide 132404-42-3				
	RL: DEV (Device component use); USES (Uses)				
	(lithium ion battery electrolyte compn.)				

RE.CNT 5

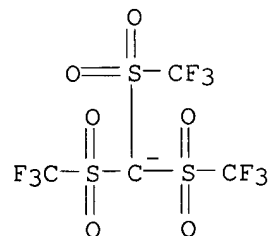
RE

- (1) American Telephone & Telegraph; EP 0312236 A 1989 HCAPLUS
- (2) Barker, J; US 5643695 A 1997 HCAPLUS
- (3) Denso Corp; EP 0847098 A 1998 HCAPLUS
- (4) Pertion, F; US 5472809 A 1995 HCAPLUS
- (5) Sharp KK; EP 0782207 A 1997 HCAPLUS

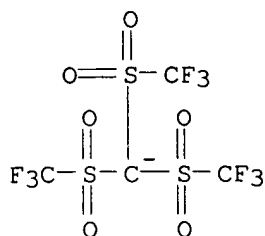
IT **132404-42-3**
 RL: DEV (Device component use); USES (Uses)
 (lithium ion battery electrolyte compn.)

RN 132404-42-3 HCAPLUS

CN Methane, tris[(trifluoromethyl)sulfonyl]-, ion(1-), lithium (9CI) (CA INDEX NAME)



Li⁺



● Li⁺

L21 ANSWER 20 OF 42 HCAPLUS COPYRIGHT 2001 ACS

AN 1999:209068 HCAPLUS

DN 130:225363

TI **Nonaqueous** electrolyte batteries

IN Yoshimura, Seiji; Kusumoto, Yasuyuki; Noma, Toshiyuki; Nishio, Koji

PA Sanyo Electric Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01M010-40

ICS H01M010-40; H01M004-02; H01M004-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

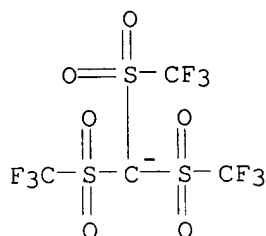
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11086902	A2	19990330	JP 1997-236691	19970902
AB	The batteries use Li-(0.1-20)% Al alloy anodes and a F contg. Li salt electrolyte dissolved in a solvent contg. 1,3-dioxolane.				
ST	battery lithium aluminum alloy anode ; dioxolane lithium salt electrolyte solvent battery				
IT	Battery anodes (aluminum-lithium alloy anodes for secondary lithium batteries)				
IT	Lithium secondary batteries (secondary lithium batteries contg. aluminum-lithium alloy anodes and 1,3-dioxolane solvent for fluorine contg. lithium salt electrolytes)				
IT	Battery electrolytes (solvents contg. 1,3-dioxolane for fluorine contg. lithium salt electrolytes in secondary lithium batteries)				
IT	66594-52-3	47160-02-9	145952-60-9	162326-79-6	221043-90-9
	221043-91-0				
	RL: DEV (Device component use); USES (Uses) (aluminum-lithium alloy anodes for secondary lithium batteries)				
IT	96-47-9, 2-Methyl tetrahydrofuran 96-48-0, .gamma.-Butyrolactone 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 109-99-9, Thf, uses 110-71-4 646-06-0, 1,3-Dioxolane 14283-07-9, Lithium fluoroborate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium trifluoromethanesulfonate 90076-65-6 132404-42-3				
	RL: DEV (Device component use); USES (Uses) (solvents contg. 1,3-dioxolane for fluorine contg. lithium salt electrolytes in secondary lithium batteries)				
IT	132404-42-3				
	RL: DEV (Device component use); USES (Uses) (solvents contg. 1,3-dioxolane for fluorine contg. lithium salt				

electrolytes in secondary lithium batteries)

RN 132404-42-3 HCAPLUS

CN Methane, tris[(trifluoromethyl)sulfonyl]-, ion(1-), lithium (9CI) (CA
INDEX NAME)



● Li⁺

L21 ANSWER 21 OF 42 HCAPLUS COPYRIGHT 2001 ACS

AN 1998:804121 HCAPLUS

DN 130:40951

TI High-temperature stable secondary **nonaqueous**-electrolyte battery
and its manufacture

IN Murata, Toshihide; Bito, Yasuhiko; Ito, Shuji; Toyoguchi, Yoshinori; Sato,
Toshitada

PA Matsushita Electric Industrial Co., Ltd., Japan

SO Eur. Pat. Appl., 32 pp.

CODEN: EPXXDW

DT Patent

LA English

IC ICM H01M004-62

ICS H01M010-40; H01M004-02

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	-----
PI	EP 883200	A2	19981209	EP 1998-110363	19980605
	EP 883200	A3	19990707		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 11191417	A2	19990713	JP 1998-147260	19980528
	US 6150053	A	20001121	US 1998-86844	19980529
	CN 1202019	A	19981216	CN 1998-109566	19980605
PRAI	JP 1997-149121	A	19970606		
	JP 1997-289426	A	19971022		

AB The battery includes a substance which produces either H₂O or CO₂ with an
increase in temp., i.e., at 60-300 or 80-300.degree., resp. The substance
is included in the **battery cathode or anode**
at 0.5-20 wt. parts/100 wt. parts of the active material of the
corresponding **electrode**. Examples of the substance which
produces H₂O include hydroxides and compds. having H₂O of crystn.
Examples of the substance which produces gaseous CO₂ include carbonates
and hydrogen carbonates.

ST battery **nonaq** electrolyte high temp stable; water formation
nonaq electrolyte battery; carbon dioxide formation **nonaq**
electrolyte battery

IT Lithium secondary batteries
(lithium-ion; high-temp. stable **nonaq.**-electrolyte)

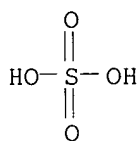
IT 124-38-9P, Carbon dioxide, preparation 7732-18-5P, Water, preparation
RL: PNU (Preparation, unclassified); PREP (Preparation)
(high-temp. stable secondary **nonaq.**-electrolyte batteries
contg. substance producing)

IT 139-12-8, Aluminum acetate 144-55-8, Sodium bicarbonate, uses
298-14-6, Potassium bicarbonate 373-02-4, Nickel acetate 471-34-1,
Calcium carbonate, uses 497-19-8, Carbonic acid disodium salt, uses
513-77-9 546-93-0, Magnesium carbonate 563-71-3, Iron carbonate
(FeCO₃) 584-08-7 584-09-8, Rubidium carbonate 814-87-9, Aluminum
oxalate 917-69-1, Cobalt acetate 1305-62-0, Calcium hydroxide, uses
1308-04-9, Cobalt oxide (Co₂O₃) 1309-42-8, Magnesium hydroxide
1313-99-1, Nickel oxide (NiO), uses 1344-28-1, Alumina, uses
3333-67-3, Nickel carbonate (NiCO₃) 3486-35-9, Zinc carbonate
7446-70-0, Aluminum chloride, uses 7542-09-8, Cobalt carbonate
7784-30-7, Aluminum phosphate 7786-81-4, Nickel sulfate
10043-01-3, Aluminum sulfate 10043-35-3, Boric acid, uses
10101-41-4, Calcium sulfate dihydrate 10294-50-5, Cobalt phosphate
octahydrate 10381-36-9, Nickel phosphate 12026-04-9, Nickel hydroxide
oxide (Ni(OH)O) 12026-24-3, Tin hydroxide (Sn(OH)₂) 12054-48-7, Nickel
hydroxide (Ni(OH)₂) 12134-11-1, Chromium hydroxide (Cr(OH)₂)
12233-29-3 12534-24-6 13138-45-9, Nickel nitrate 13455-31-7, Cobalt
perchlorate 13455-36-2, Cobalt phosphate 13637-71-3, Nickel
perchlorate 14475-63-9, Zirconium hydroxide 15519-28-5, Cesium
bicarbonate 18933-05-6, Manganese hydroxide (Mn(OH)₂) 19088-74-5,
Rubidium bicarbonate 20338-08-3 20344-49-4, Iron hydroxide oxide
(Fe(OH)O) 20427-58-1, Zinc hydroxide 21041-93-0, Cobalt hydroxide
(Co(OH)₂) 21041-95-2, Cadmium hydroxide 21645-51-2, Aluminum
hydroxide, uses 34053-87-7, Barium nitrate monohydrate 67092-84-6
134761-87-8, Cobalt oxalate
RL: MOA (Modifier or additive use); USES (Uses)
(in high-temp. stable secondary **nonaq.**-electrolyte batteries)

IT **10043-01-3**, Aluminum sulfate
RL: MOA (Modifier or additive use); USES (Uses)
(in high-temp. stable secondary **nonaq.**-electrolyte batteries)

RN 10043-01-3 HCAPLUS

CN Sulfuric acid, aluminum salt (3:2) (8CI, 9CI) (CA INDEX NAME)



2/3 Al

L21 ANSWER 22 OF 42 HCAPLUS COPYRIGHT 2001 ACS
AN 1998:764266 HCAPLUS
DN 130:40925
TI Secondary **nonaqueous**-electrolyte battery and its
anode
IN Sato, Toshitada; Bito, Yasuhiko; Murata, Toshihide; Ito, Shuji; Matsuda,
Hiromu; Toyoguchi, Yoshinori
PA Matsushita Electric Industrial Co., Ltd., Japan

ALL BAD
DATES

SO Eur. Pat. Appl., 37 pp.

CODEN: EPXXDW

DT Patent

LA English

IC ICM H01M004-48

ICS H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 880187	A2	19981125	EP 1998-109095	19980519
	EP 880187	A3	20000524		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 11040159	A2	19990212	JP 1998-134928	19980518
	CN 1200581	A	19981202	CN 1998-109226	19980522
PRAI	JP 1997-132298		19970522		
AB	An anode active material of a long-life title battery with high energy d. and showing excellent cycle life comprises LipZqXr, where Z represents .gtoreq.2 elements selected from the group of metals and semimetals .gtoreq.1 of which is selected from Na, K, Rb, Cs, Mg, Ca, Sr, Ba, Sc, Y, La, Ce, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Fe, Co, Ni, Cu, Ag, Zn, Cd and Pd; X is .gtoreq.1 element selected from O, S, Se and Te; $0 < (p + q + r) \leq 25$; $p < 10$, $0 < q < 10$; and $0 < r \leq 8$.				
ST	battery nonaq electrolyte complex oxide anode ; sulfide complex nonaq electrolyte battery anode ; telluride complex nonaq electrolyte battery anode ; selenide complex nonaq electrolyte battery anode				
IT	Battery anodes (complex oxide and selenide and sulfide and telluride nonaq .-electrolyte)				
IT	1302-42-7 6834-92-0, Sodium silicate (Na ₂ SiO ₃) 10006-28-7, Potassium silicate (K ₂ SiO ₃) 10101-39-0 11071-64-0 11073-75-9 11078-41-4 , Aluminum strontium sulfide (Al ₂ SrS ₄) 11080-70-9, Gallium strontium selenide (Ga ₂ SrSe ₄) 11094-01-2 12003-63-3 12004-04-5, Aluminum barium oxide (Al ₂ BaO ₄) 12004-37-4, Aluminum strontium oxide (Al ₂ SrO ₄) 12009-18-6, Barium tin oxide (BaSnO ₃) 12009-46-0, Barium germanium oxide (Ba ₂ GeO ₄) 12013-41-1, Calcium indium oxide (CaIn ₂ O ₄) 12013-46-6, Calcium tin oxide (CaSnO ₃) 12013-64-8, Calcium germanium oxide (Ca ₂ GeO ₄) 12013-65-9 12014-04-9, Cadmium indium oxide (CdIn ₂ O ₄) 12014-05-0, Cadmium indium selenide (CdIn ₂ Se ₄) 12014-13-0, Cadmium tin oxide (CdSnO ₃) 12025-13-7, Germanium magnesium oxide (GeMg ₂ O ₄) 12025-14-8 12025-20-6, Germanium sodium oxide (GeNa ₄ O ₄) 12025-28-4 12025-29-5, Germanium zinc oxide (GeZn ₂ O ₄) 12030-23-8, Indium strontium oxide (In ₂ SrO ₄) 12030-26-1, Indium zinc selenide (In ₂ ZnSe ₄) 12030-28-3, Indium zinc telluride (In ₂ ZnTe ₄) 12030-96-5 12032-29-0 12034-31-0 12042-68-1 12047-12-0, Barium gallium oxide (BaGa ₂ O ₄) 12047-25-5 12056-00-7, Indium magnesium oxide (In ₂ MgO ₄) 12056-03-0, Indium zinc oxide (In ₂ ZnO ₄) 12056-05-2, Indium zinc sulfide (In ₂ ZnS ₄) 12058-66-1 12058-76-3 12063-93-3 12064-13-0, Gallium magnesium oxide (Ga ₂ MgO ₄) 12064-18-5, Gallium zinc oxide (Ga ₂ ZnO ₄) 12064-22-1, Gallium zinc sulfide (Ga ₂ ZnS ₄) 12065-00-8 12068-51-8, Aluminum magnesium oxide (Al ₂ MgO ₄) 12068-53-0, Aluminum zinc oxide (Al ₂ ZnO ₄) 12138-48-6 12139-12-7, Cadmium gallium oxide (CdGa ₂ O ₄) 12139-26-3, Cadmium germanium oxide (Cd ₂ GeO ₄) 12140-76-0, Germanium strontium oxide (GeSrO ₄) 12140-79-3 12142-31-3 12142-33-5 12143-34-9, Strontium tin oxide (SrSnO ₃) 12180-94-8, Calcium gallium oxide (CaGa ₂ O ₄) 12196-48-4 12196-51-9, Indium sodium sulfide (InNaS ₂) 12201-47-7 12202-06-1, Strontium zinc oxide (SrZnO ₂) 12208-83-2 12218-60-9, Germanium zinc sulfide (GeZn ₂ S ₄) 12230-87-4, Barium zinc				

oxide (BaZnO₂) 12231-00-4 12231-04-8 12231-35-5 12232-99-4,
 Bismuth sodium oxide (BiNaO₃) 12252-16-3, Aluminum cadmium oxide
 (Al₂CdO₄) 12271-58-8, Aluminum zinc sulfide (Al₂ZnS₄) 12298-00-9,
 Gallium magnesium sulfide (Ga₂MgS₄) 12306-02-4 12315-16-1, Gallium
 strontium oxide (Ga₂SrO₄) 12359-71-6, Aluminum cadmium selenide
 (Al₂CdSe₄) 12359-83-0, Aluminum zinc selenide (Al₂ZnSe₄) 12370-60-4,
 Barium cadmium oxide (BaCdO₂) 12370-89-7, Cadmium gallium selenide
 (CdGa₂Se₄) 12370-92-2 12382-62-6, Gallium zinc selenide (Ga₂ZnSe₄)
12396-71-3 12421-31-7, Aluminum cadmium telluride (Al₂CdTe₄)
 12421-34-0, Aluminum zinc telluride (Al₂ZnTe₄) 12422-10-5, Cadmium
 gallium telluride (CdGa₂Te₄) 12422-92-3, Gallium zinc telluride
 (Ga₂ZnTe₄) 12432-08-5 12432-10-9 12437-38-6 12439-80-4
 12439-82-6, Lead zinc oxide (PbZnO₃) 12442-30-7, Cadmium zinc selenide
 (CdZnSe₂) 12500-06-0 12534-19-9 12534-22-4 12589-46-7 12589-75-2
 12590-00-0 12592-70-0, Gallium strontium sulfide (Ga₂SrS₄) 12775-70-1,
 Cadmium lead oxide (CdPbO₃) 13255-26-0, Barium silicate (BaSiO₃)
 13451-00-8 13477-19-5 13776-74-4 15123-62-3 17374-67-3
 19299-00-4 39297-18-2 39297-20-6, Aluminum strontium telluride
 (Al₂SrTe₄) 39297-27-3 39297-28-4 39297-65-9, Gallium strontium
 telluride (Ga₂SrTe₄) 39297-73-9 39297-74-0 39297-75-1, Indium
 strontium telluride (In₂SrTe₄) 39466-56-3, Cadmium zinc sulfide (CdZnS₂)
 50864-25-0 51403-77-1 51403-85-1 51403-86-2 51403-87-3
 51404-02-5 51404-22-9 51404-23-0 51680-91-2 51882-20-3
 51913-20-3 56831-86-8, Aluminum magnesium telluride (Al₂MgTe₄)
 56832-17-8 56832-18-9, Indium magnesium telluride (In₂MgTe₄)
 58499-92-6 58500-08-6 58500-11-1 58500-59-7 59087-51-3, Cadmium
 zinc oxide (CdZnO₂) 60874-08-0, Barium indium oxide (BaIn₂O₄)
 60935-89-9 60968-55-0, Cadmium germanium selenide (Cd₂GeSe₄)
 60969-07-5 61029-03-6, Germanium zinc selenide (GeZn₂Se₄) 61036-15-5,
 Aluminum magnesium selenide (Al₂MgSe₄) 61036-25-7 61216-36-2
 61216-37-3 61216-42-0 61216-43-1 61216-45-3 61216-53-3
 61231-60-5 61497-89-0 63018-05-3, Rubidium zinc oxide (Rb₂ZnO₂)
 67740-18-5 67847-61-4 75718-99-9, Barium cadmium germanium sulfide
 (BaCdGeS₄) 79470-80-7 **86567-81-9** 91698-66-7, Barium lead
 silicate (BaPb(SiO₄)) 99807-78-0 100736-82-1 107385-82-0
 111569-12-1, Cadmium zinc telluride (Cd_{0.5}Zn_{0.5}Te) 118391-36-9, Gallium
 magnesium selenide (Ga₂MgSe₄) 121458-95-5 **124358-93-6**,
 Strontium zinc sulfide (SrZnS₂) 129292-43-9, Bismuth strontium oxide
 (Bi₂SrO₆) 133494-86-7, Cadmium calcium oxide (CdCaO₂) 142747-83-9,
 Bismuth zinc oxide (Bi₂ZnO₆) 143310-91-2, Barium lead strontium oxide
 (Ba_{0.5}PbSr_{0.5}O₃) 146290-10-0, Magnesium zinc telluride (Mg_{0.5}Zn_{0.5}Te)
 151751-03-0, Potassium tin selenide (K₂SnSe₃) 155629-04-2, Magnesium
 zinc selenide (Mg_{0.5}Zn_{0.5}Se) 155629-05-3, Magnesium zinc sulfide
 (Mg_{0.5}Zn_{0.5}S) 159460-69-2, Cadmium magnesium telluride (Cd_{0.5}Mg_{0.5}Te)
 164465-85-4, Strontium zinc selenide (Sr_{0.5}Zn_{0.5}Se) **171067-34-8**,
 Aluminum potassium sulfide (AlKS₂) 174818-45-2, Cadmium indium telluride
 (CdInTe₄) 178426-93-2, Calcium zinc oxide (Ca_{0.5}Zn_{0.5}O) 193340-54-4,
 Bismuth magnesium oxide (Bi₂MgO₆) 203737-11-5, Bismuth rubidium oxide
 (BiRbO₃) 215172-96-6, Magnesium zinc oxide (MgZnO₂) 216597-81-8,
 Cadmium magnesium oxide (CdMgO₂) 216597-84-1, Bismuth calcium oxide
 (Bi₂CaO₆) 216597-86-3, Cadmium strontium oxide (CdSrO₂) 216597-92-1,
 Barium bismuth oxide (BaBi₂O₆) 216597-96-5, Barium strontium tin oxide
 (Ba_{0.5}Sr_{0.5}SnO₃) 216597-97-6, Barium strontium tin oxide
 (Ba_{0.7}Sr_{0.3}SnO₃) 216597-98-7, Barium strontium tin oxide
 (Ba_{0.9}Sr_{0.1}SnO₃) 216597-99-8, Barium calcium tin oxide (Ba_{0.5}Ca_{0.5}SnO₃)
 216598-00-4, Barium magnesium tin oxide (Ba_{0.5}Mg_{0.5}SnO₃) 216598-01-5,
 Indium rubidium oxide (InRbO₂) 216598-03-7, Aluminum strontium tin oxide
 (Al₂SrSnO₅) 216598-04-8, Aluminum strontium oxide silicate
 (Al₂SrO(SiO₄)) 216598-05-9, Aluminum lead strontium oxide (Al₂PbSrO₅)
 216598-06-0, Aluminum cadmium strontium oxide (Al₂CdSrO₄) 216598-07-1,
 Aluminum bismuth strontium oxide (AlBiSrO₄) 216598-08-2, Aluminum indium

strontium oxide (AlInSrO3) 216598-09-3, Aluminum strontium zinc oxide
 (Al2SrZnO4) 216598-10-6, Aluminum gallium strontium oxide (AlGaSrO3)
 216598-11-7, Aluminum germanium strontium oxide (Al2GeSrO4) 216598-12-8
 216598-13-9, Lead strontium tin oxide (PbSrSnO4) 216598-14-0, Cadmium
 strontium tin oxide (CdSrSnO3) 216598-15-1, Bismuth strontium tin oxide
 (Bi2SrSnO7) 216598-16-2, Indium strontium tin oxide (In2SrSnO5)
 216598-17-3, Strontium tin zinc oxide (SrSnZnO3) 216598-18-4, Gallium
 strontium tin oxide (Ga2SrSnO5) 216598-19-5, Germanium strontium tin
 oxide (GeSrSn2O4) 216598-20-8, Aluminum barium oxide silicate
 (Al2BaO(SiO4)) 216598-21-9 216598-23-1, Barium cadmium silicate
 (BaCd(SiO3)) 216598-24-2, Barium bismuth oxide silicate (BaBi2O3(SiO4))
 216598-25-3, Barium indium oxide silicate (BaIn2O(SiO4)) 216598-26-4,
 Barium zinc silicate (BaZn(SiO3)) 216598-27-5, Barium gallium oxide
 silicate (BaGa2O(SiO4)) 216598-28-6, Barium germanium oxide silicide
 (BaGeO4Si2) 216598-29-7, Aluminum barium lead oxide (Al2BaPbO5)
 216598-30-0, Barium lead tin oxide (BaPbSnO4) 216598-31-1, Barium
 cadmium lead oxide (BaCdPbO3) 216598-32-2, Barium bismuth lead oxide
 (BaBi2PbO7) 216598-33-3, Barium indium lead oxide (BaIn2PbO5)
 216598-34-4, Barium lead zinc oxide (BaPbZnO3) 216598-35-5, Barium
 gallium lead oxide (BaGa2PbO5) 216598-36-6, Barium germanium lead oxide
 (BaGePb2O4) 216598-37-7, Bismuth cadmium oxide (BiCdO4) 216598-38-8,
 Aluminum barium bismuth oxide (AlBaBiO4) 216598-39-9, Barium bismuth tin
 oxide (BaBi2SnO7) 216598-40-2, Barium bismuth cadmium oxide (BaBi2CdO6)
 216598-41-3, Barium bismuth indium oxide (BaBiInO4) 216598-42-4, Barium
 bismuth zinc oxide (BaBi2ZnO6) 216598-43-5, Barium bismuth gallium oxide
 (BaBiGaO4) 216598-44-6, Barium bismuth germanium oxide (BaBi2GeO4)
 216598-45-7, Indium strontium oxide silicate (In2SrO(SiO4)) 216598-46-8,
 Indium lead strontium oxide (In2PbSrO5) 216598-47-9, Cadmium indium
 strontium oxide (CdIn2SrO4) 216598-48-0, Bismuth indium strontium oxide
 (BiInSrO4) 216598-49-1, Indium strontium zinc oxide (In2SrZnO4)
 216598-50-4, Gallium indium strontium oxide (GaInSrO3) 216598-51-5,
 Germanium indium strontium oxide (GeIn2SrO4) 216598-52-6, Tin zinc oxide
 (SnZnO4) 216598-53-7, Aluminum gallium magnesium oxide (AlGaMgO3)
 216598-54-8, Gallium magnesium tin oxide (Ga2MgSnO5)
 RL: DEV (Device component use); PRP (Properties); USES (Uses).

(anode in high-performance nonaq.-electrolyte
 batteries)

IT 216598-55-9, Gallium magnesium oxide silicate (Ga2MgO3(SiO4))
 216598-56-0, Gallium lead magnesium oxide (Ga2PbMgO5) 216598-57-1,
 Cadmium gallium magnesium oxide (CdGa2MgO4) 216598-58-2, Bismuth gallium
 magnesium oxide (BiGaMgO4) 216598-59-3, Gallium indium magnesium oxide
 (GaInMgO3) 216598-60-6, Gallium magnesium zinc oxide (Ga2MgZnO4)
 216598-61-7, Gallium germanium magnesium oxide (Ga2GeMgO4) 216598-62-8,
 Aluminum germanium magnesium oxide (Al2GeMgO5) 216598-63-9, Germanium
 magnesium tin oxide (GeMgSnO4) 216598-64-0 216598-65-1, Germanium lead
 magnesium oxide (GePbMgO4) 216598-66-2, Cadmium germanium magnesium
 oxide (CdGeMgO3) 216598-67-3, Bismuth germanium magnesium oxide
 (Bi2GeMgO7) 216598-68-4, Germanium indium magnesium oxide (GeIn2MgO5)
 216598-69-5, Germanium magnesium zinc oxide (GeMgZnO3) 216598-70-8,
 Gallium germanium magnesium oxide (Ga2GeMgO5) 216598-71-9, Lead
 magnesium sulfide (PbMgS3) 216598-72-0, Cadmium magnesium sulfide
 (CdMgS2) 216598-73-1, Bismuth magnesium sulfide (Bi2MgS6) 216598-74-2,
 Calcium lead sulfide (CaPbS3) 216598-75-3, Cadmium calcium sulfide
 (CdCaS2) 216598-76-4, Bismuth calcium sulfide (Bi2CaS6) 216598-77-5
 216598-78-6, Lead strontium sulfide (PbSrS3) 216598-79-7, Cadmium
 strontium sulfide (CdSrS2) 216598-80-0, Bismuth strontium sulfide
 (Bi2SrS6) 216598-81-1 216598-82-2, Barium lead sulfide (BaPbS3)
 216598-83-3, Barium bismuth sulfide (BaBi2S6) 216598-84-4, Barium
 strontium tin sulfide (Ba0.5Sr0.5SnS3) 216598-85-5, Barium strontium tin
 sulfide (Ba0.7Sr0.3SnS3) 216598-86-6, Barium strontium tin sulfide
 (Ba0.9Sr0.1SnS3) 216598-87-7, Barium calcium tin sulfide

(Ba_{0.5}Ca_{0.5}SnS₃) 216598-88-8, Barium magnesium tin sulfide
 (Ba_{0.5}Mg_{0.5}SnS₃) 216598-89-9 216598-90-2, Barium lead strontium
 sulfide (Ba_{0.5}PbSr_{0.5}S₃) **216598-91-3**, Aluminum sodium sulfide
 (AlNaS₂) 216598-92-4, Lead sodium sulfide (PbNa₂S₃) 216598-93-5,
 Bismuth sodium sulfide (BiNaS₃) 216598-94-6 216598-95-7, Lead
 potassium sulfide (PbK₂S₃) 216598-96-8, Cadmium potassium sulfide
 (CdK₂S₂) 216598-97-9, Bismuth potassium sulfide (BiK₂S₃)
216598-98-0, Potassium zinc sulfide (K₂ZnS₂) 216598-99-1,
 Gallium potassium sulfide (GaKS₂) 216599-00-7, Germanium potassium
 sulfide (GeK₄S₄) **216599-01-8**, Aluminum sodium tin sulfide
 (Al₂Na₂SnS₅) **216599-02-9**, Aluminum sodium sulfide thiosilicate
 (Al₂Na₂S(SiS₄)) **216599-03-0**, Aluminum lead sodium sulfide
 (Al₂PbNa₂S₅) **216599-04-1**, Aluminum cadmium sodium sulfide
 (Al₂CdNa₂S₄) **216599-05-2**, Aluminum bismuth sodium sulfide
 (AlBiNa₂S₄) **216599-06-3**, Aluminum indium sodium sulfide
 (AlInNa₂S₃) **216599-07-4**, Aluminum sodium zinc sulfide
 (Al₂Na₂ZnS₄) **216599-08-5**, Aluminum gallium sodium sulfide
 (AlGaNa₂S₃) **216599-09-6**, Aluminum germanium sodium sulfide
 (Al₂GeNa₂S₄) **216599-10-9**, Aluminum strontium tin sulfide
 (Al₃SrSnS₅) 216599-11-0 216599-12-1, Lead strontium tin sulfide
 (PbSrSnS₄) 216599-13-2, Cadmium strontium tin sulfide (CdSrSnS₃)
 216599-14-3, Bismuth strontium tin sulfide (Bi₂SrSnS₇) 216599-15-4,
 Indium strontium tin sulfide (In₂SrSnS₅) **216599-16-5**, Strontium
 tin zinc sulfide (SrSnZnS₃) 216599-17-6, Gallium strontium tin sulfide
 (Ga₂SrSnS₅) 216599-18-7, Germanium strontium tin sulfide (GeSrSnS₂S₄)
 216599-19-8, Aluminum barium sulfide thiosilicate (Al₂BaS(SiS₄))
 216599-20-1 216599-21-2 216599-22-3, Barium cadmium silicide sulfide
 (BaCdSiS₃) 216599-23-4, Barium bismuth sulfide thiosilicate
 (BaBi₂S₃(SiS₄)) 216599-24-5, Barium indium sulfide thiosilicate
 (BaIn₂S(SiS₄)) 216599-25-6, Barium zinc silicide sulfide (BaZnSiS₃)
 216599-26-7, Barium gallium sulfide thiosilicate (BaGa₂S(SiS₄))
 216599-27-8, Barium germanium silicide sulfide (BaGeSi₂S₄)
216599-28-9, Aluminum calcium lead sulfide (Al₂CaPbS₅)
 216599-29-0, Calcium lead tin sulfide (CaPbSnS₄) 216599-30-3
 216599-31-4, Cadmium calcium lead sulfide (CdCaPbS₃) 216599-32-5,
 Bismuth calcium lead sulfide (Bi₂CaPbS₇) 216599-33-6, Calcium indium
 lead sulfide (CaIn₂PbS₅) **216599-34-7**, Calcium lead zinc sulfide
 (CaPbZnS₃) 216599-35-8, Calcium gallium lead sulfide (CaGa₂PbS₅)
 216599-36-9, Calcium germanium lead sulfide (CaGePb₂S₄)
216599-37-0, Aluminum cadmium calcium sulfide (Al₂CdCaS₄)
 216599-38-1, Cadmium calcium tin sulfide (CdCaSnS₃) 216599-39-2, Cadmium
 calcium silicide sulfide (CdCaSiS₃) 216599-40-5, Bismuth cadmium calcium
 sulfide (BiCdCaS₄) 216599-41-6, Cadmium calcium indium sulfide
 (CdCaInS₂S₄) **216599-42-7**, Cadmium calcium zinc sulfide (CdCaZnS₂)
 216599-43-8, Cadmium calcium gallium sulfide (CdCaGa₂S₅) 216599-44-9,
 Cadmium calcium germanium sulfide (Cd₂CaGeS₅) 216599-45-0, Aluminum
 bismuth magnesium sulfide (AlBiMgS₅) 216599-46-1, Bismuth magnesium tin
 sulfide (Bi₂MgSnS₈) 216599-47-2, Bismuth magnesium sulfide thiosilicate
 (Bi₂MgS₄(SiS₄)) 216599-48-3, Bismuth lead magnesium sulfide (Bi₂PbMgS₈)
 216599-49-4, Bismuth cadmium magnesium sulfide (Bi₂CdMgS₇) 216599-50-7,
 Bismuth indium magnesium sulfide (BiInMgS₅) 216599-51-8, Bismuth
 magnesium zinc sulfide (Bi₂MgZnS₇) 216599-52-9, Bismuth gallium
 magnesium sulfide (BiGaMgS₅) 216599-53-0, Bismuth germanium magnesium
 sulfide (Bi₂GeMgS₅) **216599-54-1**, Aluminum indium potassium
 sulfide (AlInK₂S₄) 216599-55-2, Indium potassium tin sulfide (In₂K₂SnS₆)
 216599-56-3, Indium potassium sulfide thiosilicate (In₂K₂S₂(SiS₄))
 216599-57-4, Indium lead potassium sulfide (In₂PbK₂S₆) 216599-58-5,
 Cadmium indium potassium sulfide (CdIn₂K₂S₅) 216599-59-6, Bismuth indium
 potassium sulfide (BiInK₂S₅) **216599-60-9**, Indium potassium zinc
 sulfide (In₂K₂ZnS₅) 216599-61-0, Gallium indium potassium sulfide
 (GaInK₂S₄) 216599-62-1, Germanium indium potassium sulfide (GeIn₂K₂S₅)

216599-63-2, Tin zinc sulfide (SnZnS_4) 216599-64-3 216599-65-4, Lead
 zinc sulfide (PbZnS_3) 216599-66-5, Bismuth zinc sulfide (Bi_2ZnS_6)
216599-67-6, Aluminum gallium strontium sulfide (AlGaSrS_4)
 216599-68-7, Gallium strontium tin sulfide ($\text{Ga}_2\text{SrSnS}_6$) 216599-69-8,
 Gallium strontium sulfide thiosilicate ($\text{Ga}_2\text{SrS}_4(\text{SiS}_4)$) 216599-70-1,
 Gallium lead strontium sulfide ($\text{Ga}_2\text{PbSrS}_6$) 216599-71-2, Cadmium gallium
 strontium sulfide ($\text{CdGa}_2\text{SrS}_5$) 216599-72-3, Bismuth gallium strontium
 sulfide (BiGaSrS_5) 216599-73-4, Gallium indium strontium sulfide
 (GaInSrS_4) **216599-74-5**, Gallium strontium zinc sulfide
 ($\text{Ga}_2\text{SrZnS}_5$) 216599-75-6, Gallium germanium strontium sulfide ($\text{Ga}_2\text{GeSrS}_5$)
 216599-76-7, Aluminum barium germanium sulfide ($\text{Al}_2\text{BaGeS}_6$) 216599-77-8,
 Barium germanium tin sulfide (BaGeSnS_5) 216599-78-9, Barium germanium
 sulfide thiosilicate ($\text{BaGe}(\text{SiS}_4)$) 216599-79-0, Barium germanium lead
 sulfide (BaGePbS_5) 216599-80-3, Barium bismuth germanium sulfide
 ($\text{BaBi}_2\text{GeS}_8$) 216599-81-4, Barium germanium indium sulfide ($\text{BaGeIn}_2\text{S}_6$)
 216599-82-5, Barium germanium zinc sulfide (BaGeZnS_4) 216599-83-6,
 Barium gallium germanium sulfide ($\text{BaGa}_2\text{GeS}_6$) 216599-84-7, Magnesium tin
 selenide (MgSnSe_3) 216599-85-8 216599-86-9, Lead magnesium selenide
 (PbMgSe_3) 216599-87-0, Cadmium magnesium selenide (CdMgSe_2)
 216599-88-1, Bismuth magnesium selenide (Bi_2MgSe_6) 216599-89-2,
 Germanium magnesium selenide (GeMg_2Se_4) 216599-90-5, Calcium tin
 selenide (CaSnSe_3) 216599-91-6 216599-92-7, Calcium lead selenide
 (CaPbSe_3) 216599-93-8, Cadmium calcium selenide (CdCaSe_2) 216599-94-9,
 Bismuth calcium selenide (Bi_2CaSe_6) 216599-95-0, Calcium indium selenide
 (CaIn_2Se_4) 216599-96-1, Calcium zinc selenide (CaZnSe_2) 216599-97-2,
 Calcium germanium selenide (Ca_2GeSe_4) 216599-98-3, Aluminum strontium
 selenide (Al_2SrSe_4) 216599-99-4, Strontium tin selenide (SrSnSe_3)
 216600-00-9 216600-01-0, Lead strontium selenide (PbSrSe_3)
 216600-02-1, Cadmium strontium selenide (CdSrSe_2) 216600-03-2, Bismuth
 strontium selenide (Bi_2SrSe_6) 216600-04-3, Germanium strontium selenide
 (GeSr_2Se_4) 216600-05-4 216600-06-5, Barium lead selenide (BaPbSe_3)
 216600-07-6, Barium cadmium selenide (BaCdSe_2) 216600-08-7, Barium
 bismuth selenide (BaBi_2Se_6) 216600-09-8, Barium zinc selenide (BaZnSe_2)
 216600-10-1, Barium germanium selenide (Ba_2GeSe_4) 216600-11-2, Barium
 strontium tin selenide ($\text{Ba}_0.5\text{Sr}_0.5\text{SnSe}_3$) 216600-12-3, Barium strontium
 tin selenide ($\text{Ba}_0.9\text{Sr}_0.1\text{SnSe}_3$) 216600-13-4, Barium calcium tin selenide
 ($\text{Ba}_0.5\text{Ca}_0.5\text{SnSe}_3$) 216600-14-5, Barium magnesium tin selenide
 ($\text{Ba}_0.5\text{Mg}_0.5\text{SnSe}_3$) 216600-15-6 216600-16-7, Barium lead strontium
 selenide ($\text{Ba}_0.5\text{PbSr}_0.5\text{Se}_3$) 216600-17-8 216600-18-9, Lead sodium
 selenide (PbNa_2Se_3) 216600-19-0, Cadmium sodium selenide (CdNa_2Se_2)
 216600-20-3, Bismuth sodium selenide (BiNaSe_3) 216600-21-4, Sodium zinc
 selenide (Na_2ZnSe_2) 216600-22-5, Gallium sodium selenide (GaNaSe_2)
 216600-23-6 216600-24-7, Lead potassium selenide (PbK_2Se_3)
 216600-25-8, Cadmium potassium selenide (CdK_2Se_2) 216600-26-9, Bismuth
 potassium selenide (BiKSe_3) 216600-27-0, Potassium zinc selenide
 (K_2ZnSe_2) 216600-28-1, Germanium potassium selenide (GeK_4Se_4)
 216600-29-2 216600-30-5, Aluminum cadmium strontium selenide
 ($\text{Al}_2\text{CdSrSe}_5$) 216600-31-6, Aluminum bismuth strontium selenide
 (AlBiSrSe_5) 216600-32-7, Aluminum indium strontium selenide (AlInSrSe_4)
 216600-33-8, Aluminum strontium zinc selenide ($\text{Al}_2\text{SrZnSe}_5$) 216600-34-9,
 Aluminum gallium strontium selenide (AlGaSrSe_4) 216600-35-0, Aluminum
 germanium strontium selenide ($\text{Al}_2\text{GeSrSe}_5$) 216600-36-1, Aluminum barium
 tin selenide ($\text{Al}_2\text{BaSnSe}_6$) 216600-37-2, Aluminum lead strontium selenide
 ($\text{Al}_2\text{PbSrSe}_6$) 216600-38-3, Barium tin selenide selenosilicate
 ($\text{BaSnSe}(\text{SiSe}_4)$) 216600-39-4, Barium lead tin selenide (BaPbSnSe_5)
 216600-40-7, Barium cadmium tin selenide (BaCdSnSe_4) 216600-41-8, Barium
 bismuth tin selenide ($\text{BaBi}_2\text{SnSe}_8$) 216600-42-9, Barium indium tin
 selenide ($\text{BaIn}_2\text{SnSe}_6$) 216600-43-0, Barium gallium tin selenide
 ($\text{BaGa}_2\text{SnSe}_6$) 216600-44-1, Barium germanium tin selenide ($\text{BaGeSn}_2\text{Se}_5$)
 216600-45-2 216600-46-3, Potassium tin selenide selenosilicate
 ($\text{K}_2\text{SnSe}(\text{SiSe}_4)$) 216600-47-4, Lead potassium selenide selenosilicate

(PbK₂Se(SiSe₄)) 216600-48-5, Barium tin zinc selenide (BaSnZnSe₄)
 216600-49-6 216600-50-9 216600-51-0, Indium potassium selenide
 selenosilicate (In₂K₂Se₂(SiSe₄)) 216600-52-1 216600-53-2
 216600-54-3, Germanium potassium selenide silicide (GeK₂Se₅Si₂)
 216600-55-4, Aluminum lead magnesium selenide (Al₂PbMgSe₆) 216600-56-5,
 Lead magnesium tin selenide (PbMgSnSe₅) 216600-57-6, Lead magnesium
 selenide selenosilicate (PbMgSe(SiSe₄)) 216600-58-7, Cadmium lead
 magnesium selenide (CdPbMgSe₄) 216600-59-8, Bismuth lead magnesium
 selenide (Bi₂PbMgSe₈) 216600-60-1, Indium lead magnesium selenide
 (In₂PbMgSe₆) 216600-61-2, Lead magnesium zinc selenide (PbMgZnSe₄)
 216600-62-3, Gallium lead magnesium selenide (Ga₂PbMgSe₆) 216600-63-4,
 Germanium lead magnesium selenide (GePb₂MgSe₅) 216600-64-5, Cadmium tin
 selenide (CdSnSe₃) 216600-65-6 216600-66-7, Cadmium lead selenide
 (CdPbSe₃) 216600-67-8, Bismuth cadmium selenide (BiCdSe₄) 216600-68-9,
 Aluminum bismuth calcium selenide (AlBiCaSe₅) 216600-69-0, Bismuth
 calcium tin selenide (Bi₂CaSnSe₈) 216600-70-3, Bismuth calcium selenide
 selenosilicate (Bi₂CaSe₄(SiSe₄)) 216600-71-4, Bismuth calcium lead
 selenide (Bi₂CaPbSe₈) 216600-72-5, Bismuth cadmium calcium selenide
 (Bi₂CdCaSe₇) 216600-73-6, Bismuth calcium indium selenide (BiCaInSe₅)
 216600-74-7, Bismuth calcium zinc selenide (Bi₂CaZnSe₇) 216600-75-8,
 Bismuth calcium gallium selenide (BiCaGaSe₅) 216600-76-9, Bismuth
 calcium germanium selenide (Bi₂CaGeSe₅) 216600-77-0, Indium strontium
 tin selenide (In₂SrSnSe₆) 216600-78-1, Indium lead strontium selenide
 (In₂PbSrSe₆) 216600-79-2, Cadmium indium strontium selenide (CdIn₂SrSe₅)
 216600-80-5, Bismuth indium strontium selenide (BiInSrSe₅) 216600-81-6,
 Indium strontium zinc selenide (In₂SrZnSe₅) 216600-82-7, Gallium indium
 strontium selenide (GaInSrSe₄) 216600-83-8, Germanium indium strontium
 selenide (GeIn₂SrSe₅) 216600-84-9, Tin zinc selenide (SnZnSe₄)
 216600-85-0 216600-86-1, Lead zinc selenide (PbZnSe₃) 216600-87-2,
 Bismuth zinc selenide (Bi₂ZnSe₆) 216600-88-3, Aluminum gallium magnesium
 selenide (AlGaMgSe₄) 216600-89-4, Gallium magnesium tin selenide
 (Ga₂MgSnSe₆) 216600-90-7 216600-91-8, Cadmium gallium magnesium
 selenide (CdGa₂MgSe₅) 216600-92-9, Bismuth gallium magnesium selenide
 (BiGaMgSe₅)

RL: DEV (Device component use); PRP (Properties); USES (Uses)

(**anode** in high-performance **nonaq.**-electrolyte
 batteries)

IT 216600-93-0, Gallium indium magnesium selenide (GaInMgSe₄) 216600-94-1,
 Gallium magnesium zinc selenide (Ga₂MgZnSe₅) 216600-95-2, Gallium
 germanium magnesium selenide (Ga₂GeMgSe₅) 216600-96-3, Aluminum
 germanium strontium selenide (Al₂GeSrSe₆) 216600-97-4, Germanium
 strontium tin selenide (GeSrSnSe₅) 216600-98-5 216600-99-6, Germanium
 lead strontium selenide (GePbSrSe₅) 216601-00-2, Cadmium germanium
 strontium selenide (CdGeSrSe₄) 216601-01-3, Bismuth germanium strontium
 selenide (Bi₂GeSrSe₈) 216601-02-4, Germanium indium strontium selenide
 (GeIn₂SrSe₆) 216601-03-5, Germanium strontium zinc selenide (GeSrZnSe₄)
 216601-04-6, Gallium germanium strontium selenide (Ga₂GeSrSe₆)
 216601-05-7, Magnesium tin telluride (MgSnTe₃) 216601-06-8, Lead
 magnesium telluride (PbMgTe₃) 216601-07-9, Bismuth magnesium telluride
 (Bi₂MgTe₆) 216601-09-1, Germanium magnesium telluride (GeMg₂Te₄)
 216601-10-4, Aluminum calcium telluride (Al₂CaTe₄) 216601-11-5, Calcium
 tin telluride (CaSnTe₃) 216601-12-6 216601-13-7, Calcium lead
 telluride (CaPbTe₃) 216601-14-8, Cadmium calcium telluride (CdCaTe₂)
 216601-15-9, Bismuth calcium telluride (Bi₂CaTe₆) 216601-16-0, Calcium
 indium telluride (CaIn₂Te₄) 216601-17-1, Calcium zinc telluride
 (CaZnTe₂) 216601-18-2, Calcium gallium telluride (CaGa₂Te₄)
 216601-19-3, Calcium germanium telluride (Ca₂GeTe₄) 216601-21-7,
 Strontium tin telluride (SrSnTe₃) 216601-22-8 216601-23-9, Lead
 strontium telluride (PbSrTe₃) 216601-24-0, Cadmium strontium telluride
 (CdSrTe₂) 216601-25-1, Bismuth strontium telluride (Bi₂SrTe₆)
 216601-27-3, Strontium zinc telluride (SrZnTe₂) 216601-29-5, Germanium

strontium telluride (GeSr_2Te_4) 216601-30-8, Barium tin telluride
 (BaSnTe_3) 216601-31-9 216601-32-0, Barium lead telluride (BaPbTe_3)
 216601-33-1, Barium cadmium telluride (BaCdTe_2) 216601-34-2, Barium
 bismuth telluride (BaBi_2Te_6) 216601-35-3, Barium zinc telluride
 (BaZnTe_2) 216601-36-4, Barium germanium telluride (Ba_2GeTe_4)
 216601-37-5, Barium strontium tin telluride ($\text{Ba}_{0.5}\text{Sr}_{0.5}\text{SnTe}_3$)
 216601-38-6, Barium strontium tin telluride ($\text{Ba}_{0.7}\text{Sr}_{0.3}\text{SnTe}_3$)
 216601-39-7, Barium strontium tin telluride ($\text{Ba}_{0.9}\text{Sr}_{0.1}\text{SnTe}_3$)
 216601-40-0, Barium magnesium tin telluride ($\text{Ba}_{0.5}\text{Mg}_{0.5}\text{SnTe}_3$)
 216601-41-1 216601-42-2, Barium lead strontium telluride
 ($\text{Ba}_{0.5}\text{PbSr}_{0.5}\text{Te}_3$) 216601-43-3, Sodium tin telluride (Na_2SnTe_3)
 216601-44-4 216601-45-5, Lead sodium telluride (PbNa_2Te_3) 216601-46-6,
 Cadmium sodium telluride (CdNa_2Te_2) 216601-47-7, Bismuth sodium
 telluride (BiNaTe_3) 216601-48-8, Sodium zinc telluride (Na_2ZnTe_2)
 216601-49-9, Germanium sodium telluride (GeNa_4Te_4) 216601-50-2,
 Potassium tin telluride (K_2SnTe_3) 216601-51-3, Lead potassium telluride
 (PbK_2Te_3) 216601-52-4, Cadmium potassium telluride (CdK_2Te_2)
 216601-53-5, Bismuth potassium telluride (BiKTe_3) 216601-54-6, Potassium
 zinc telluride (K_2ZnTe_2) 216601-55-7, Aluminum strontium tin telluride
 ($\text{Al}_2\text{SrSnTe}_6$) 216601-56-8 216601-57-9, Aluminum lead strontium
 telluride ($\text{Al}_2\text{PbSrTe}_6$) 216601-58-0, Aluminum cadmium strontium telluride
 ($\text{Al}_2\text{CdSrTe}_5$) 216601-59-1, Aluminum bismuth strontium telluride
 (AlBiSrTe_5) 216601-60-4, Aluminum indium strontium telluride (AlInSrTe_4)
 216601-61-5, Aluminum strontium zinc telluride ($\text{Al}_2\text{SrZnTe}_5$) 216601-62-6,
 Aluminum gallium strontium telluride (AlGaSrTe_4) 216601-63-7, Aluminum
 germanium strontium telluride ($\text{Al}_2\text{GeSrTe}_5$) 216601-64-8, Aluminum barium
 tin telluride ($\text{Al}_2\text{BaSnTe}_6$) 216601-65-9, Barium tin telluride
 tellurosilicate ($\text{BaSnTe}(\text{SiTe}_4)$) 216601-66-0, Barium lead tin telluride
 (BaPbSnTe_5) 216601-67-1, Barium cadmium tin telluride (BaCdSnTe_4)
 216601-68-2, Barium bismuth tin telluride ($\text{BaBi}_2\text{SnTe}_8$) 216601-69-3,
 Barium indium tin telluride ($\text{BaIn}_2\text{SnTe}_5$) 216601-70-6, Barium tin zinc
 telluride (BaSnZnTe_4) 216601-71-7, Barium gallium tin telluride
 ($\text{BaGa}_2\text{SnTe}_6$) 216601-72-8, Barium germanium tin telluride ($\text{BaGeSn}_2\text{Te}_5$)
 216601-73-9 216601-74-0, Potassium tin telluride tellurosilicate
 ($\text{K}_2\text{SnTe}(\text{SiTe}_4)$) 216601-75-1, Lead potassium telluride tellurosilicate
 ($\text{PbK}_2\text{Te}(\text{SiTe}_4)$) 216601-76-2 216601-77-3 216601-78-4 216601-79-5
 216601-80-8 216601-81-9, Germanium potassium silicide telluride
 ($\text{GeK}_2\text{Si}_2\text{Te}_5$) 216601-82-0, Aluminum lead magnesium telluride ($\text{Al}_2\text{PbMgTe}_6$)
 216601-83-1, Lead magnesium tin telluride (PbMgSnTe_5) 216601-84-2, Lead
 magnesium telluride tellurosilicate ($\text{PbMgTe}(\text{SiTe}_4)$) 216601-85-3, Cadmium
 lead magnesium telluride (CdPbMgTe_4) 216601-86-4, Bismuth lead magnesium
 telluride ($\text{Bi}_2\text{PbMgTe}_8$) 216601-87-5, Indium lead magnesium telluride
 ($\text{In}_2\text{PbMgTe}_6$) 216601-88-6, Lead magnesium zinc telluride (PbMgZnTe_4)
 216601-89-7, Gallium lead magnesium telluride ($\text{Ga}_2\text{PbMgTe}_6$) 216601-90-0,
 Germanium lead magnesium telluride ($\text{GePb}_2\text{MgTe}_5$) 216601-91-1, Cadmium tin
 telluride (CdSnTe_3) 216601-92-2 216601-93-3, Cadmium lead telluride
 (CdPbTe_3) 216601-94-4, Bismuth cadmium telluride (BiCdTe_4)
 216601-95-5, Cadmium germanium telluride (Cd_2GeTe_4) 216601-96-6, Bismuth
 strontium tin telluride ($\text{Bi}_2\text{SrSnTe}_8$) 216601-97-7 216601-98-8, Bismuth
 lead strontium telluride ($\text{Bi}_2\text{PbSrTe}_8$) 216601-99-9, Bismuth cadmium
 strontium telluride ($\text{Bi}_2\text{CdSrTe}_7$) 216602-00-5, Bismuth indium strontium
 telluride (BiInSrTe_5) 216602-01-6, Bismuth strontium zinc telluride
 ($\text{Bi}_2\text{SrZnTe}_7$) 216602-02-7, Bismuth gallium strontium telluride
 (BiGaSrTe_5) 216602-03-8, Aluminum barium indium telluride (AlBaInTe_4)
 216602-04-9, Barium indium tin telluride ($\text{BaIn}_2\text{SnTe}_6$) 216602-05-0,
 Barium indium telluride tellurosilicate ($\text{BaIn}_2\text{Te}_2(\text{SiTe}_4)$) 216602-06-1,
 Barium indium lead telluride ($\text{BaIn}_2\text{PbTe}_6$) 216602-07-2, Barium cadmium
 indium telluride ($\text{BaCdIn}_2\text{Te}_5$) 216602-08-3, Barium bismuth indium
 telluride (BaBiInTe_5) 216602-09-4, Barium indium zinc telluride
 ($\text{BaIn}_2\text{ZnTe}_5$) 216602-10-7, Barium gallium indium telluride (BaGaInTe_4)
 216602-11-8, Barium germanium indium telluride ($\text{BaGeIn}_2\text{Te}_5$) 216602-12-9,

Tin zinc telluride (SnZnTe_4) 216602-13-0 216602-14-1, Lead zinc telluride (PbZnTe_3) 216602-15-2, Bismuth zinc telluride (Bi_2ZnTe_6) 216602-16-3, Germanium zinc telluride (GeZn_2Te_4) 216602-17-4, Aluminum gallium magnesium telluride (AlGaMgTe_4) 216602-18-5, Gallium magnesium tin telluride ($\text{Ga}_2\text{MgSnTe}_6$) 216602-19-6 216602-20-9, Cadmium gallium magnesium telluride ($\text{CdGa}_2\text{MgTe}_5$) 216602-21-0, Bismuth gallium magnesium telluride (BiGaMgTe_5) 216602-22-1, Gallium indium magnesium telluride (GaInMgTe_4) 216602-23-2, Gallium magnesium zinc telluride ($\text{Ga}_2\text{MgZnTe}_5$) 216602-24-3, Gallium germanium magnesium telluride ($\text{Ga}_2\text{GeMgTe}_5$) 216602-25-4, Aluminum calcium germanium telluride ($\text{Al}_2\text{CaGeTe}_6$) 216602-26-5, Calcium germanium tin telluride (CaGeSnTe_5) 216602-27-6 216602-28-7, Calcium germanium lead telluride (CaGePbTe_5) 216602-29-8, Cadmium calcium germanium telluride (CdCaGeTe_4) 216602-30-1, Bismuth calcium germanium telluride ($\text{Bi}_2\text{CaGeTe}_8$) 216602-31-2, Calcium germanium indium telluride ($\text{CaGeIn}_2\text{Te}_6$) 216602-32-3, Calcium germanium zinc telluride (CaGeZnTe_4) 216602-33-4, Calcium gallium germanium telluride ($\text{CaGa}_2\text{GeTe}_6$) 216602-34-5, Lithium magnesium tin oxide ($\text{Li}_0.1\text{MgSnO}_3$) 216602-35-6, Lithium magnesium tin oxide ($\text{Li}_0.5\text{MgSnO}_3$) 216602-36-7, Lithium magnesium tin oxide (LiMgSnO_3) 216602-37-8, Lithium magnesium tin oxide ($\text{Li}_2\text{MgSnO}_3$) 216602-38-9, Lithium magnesium tin oxide ($\text{Li}_3\text{MgSnO}_3$) 216602-39-0, Lithium magnesium tin oxide ($\text{Li}_4\text{MgSnO}_3$) 216602-40-3, Lithium magnesium tin oxide ($\text{Li}_5\text{MgSnO}_3$) 216602-41-4, Lithium magnesium tin oxide ($\text{Li}_6\text{MgSnO}_3$) 216602-42-5, Lithium magnesium tin oxide ($\text{Li}_7\text{MgSnO}_3$) 216602-43-6, Lithium magnesium tin oxide ($\text{Li}_8\text{MgSnO}_3$) 216602-44-7, Lithium magnesium tin oxide ($\text{Li}_9\text{MgSnO}_3$) 216602-45-8, Lithium magnesium tin oxide ($\text{Li}_{10}\text{MgSnO}_3$) 216602-46-9, Lithium magnesium tin oxide ($\text{Li}_{11}\text{MgSnO}_3$) 216602-47-0, Lithium magnesium tin oxide ($\text{Li}_{12}\text{MgSnO}_3$) 216602-48-1, Antimony lithium tin oxide ($\text{SbLi}_0.1\text{SnO}_3$) 216602-49-2, Antimony lithium tin oxide ($\text{SbLi}_0.5\text{SnO}_3$) 216602-50-5, Barium lithium strontium tin oxide (BaLiSrSnO_3) 216602-51-6, Barium lithium strontium tin oxide ($\text{BaLi}_2\text{SrSnO}_3$) 216602-52-7, Barium lithium strontium tin oxide ($\text{BaLi}_3\text{SrSnO}_3$) 216602-53-8, Barium lithium strontium tin oxide ($\text{BaLi}_4\text{SrSnO}_3$) 216602-54-9, Barium lithium strontium tin oxide ($\text{BaLi}_5\text{SrSnO}_3$) 216602-55-0, Barium lithium strontium tin oxide ($\text{BaLi}_6\text{SrSnO}_3$) 216602-56-1, Barium lithium strontium tin oxide ($\text{BaLi}_7\text{SrSnO}_3$) 216602-57-2, Barium lithium strontium tin oxide ($\text{BaLi}_8\text{SrSnO}_3$) 216602-58-3, Barium lithium strontium tin oxide ($\text{BaLi}_9\text{SrSnO}_3$) 216602-59-4, Barium lithium strontium tin oxide ($\text{BaLi}_{10}\text{SrSnO}_3$) 216602-60-7, Barium lithium strontium tin oxide ($\text{BaLi}_{11}\text{SrSnO}_3$) 216602-61-8, Barium lithium strontium tin oxide ($\text{BaLi}_{12}\text{SrSnO}_3$) 216602-62-9, Calcium lithium tin sulfide ($\text{CaLi}_0.1\text{SnS}_3$) 216602-63-0, Calcium lithium tin sulfide ($\text{CaLi}_0.5\text{SnS}_3$) 216602-64-1, Calcium lithium tin sulfide (CaLiSnS_3) 216602-65-2, Calcium lithium tin sulfide ($\text{CaLi}_2\text{SnS}_3$) 216602-66-3, Calcium lithium tin sulfide ($\text{CaLi}_3\text{SnS}_3$) 216602-67-4, Calcium lithium tin sulfide ($\text{CaLi}_4\text{SnS}_3$) 216602-68-5, Calcium lithium tin sulfide ($\text{CaLi}_5\text{SnS}_3$) 216602-69-6, Calcium lithium tin sulfide ($\text{CaLi}_6\text{SnS}_3$) 216602-70-9, Calcium lithium tin sulfide ($\text{CaLi}_7\text{SnS}_3$) 216602-71-0, Calcium lithium tin sulfide ($\text{CaLi}_8\text{SnS}_3$) 216602-72-1, Calcium lithium tin sulfide ($\text{CaLi}_9\text{SnS}_3$) 216602-73-2, Calcium lithium tin sulfide ($\text{CaLi}_{10}\text{SnS}_3$) 216602-74-3, Calcium lithium tin sulfide ($\text{CaLi}_{11}\text{SnS}_3$) 216602-75-4, Calcium lithium tin sulfide ($\text{CaLi}_{12}\text{SnS}_3$) 216602-76-5, Lithium strontium tin selenide ($\text{Li}_0.1\text{SrSnSe}_3$) 216602-77-6, Lithium strontium tin selenide ($\text{Li}_0.5\text{SrSnSe}_3$) 216602-78-7, Lithium strontium tin selenide (LiSrSnSe_3) 216602-79-8, Calcium lithium tin selenide ($\text{CaLi}_2\text{SnSe}_3$) 216602-80-1, Calcium lithium tin selenide ($\text{CaLi}_3\text{SnSe}_3$) 216602-81-2, Calcium lithium tin selenide ($\text{CaLi}_4\text{SnSe}_3$) 216602-82-3, Calcium lithium tin selenide ($\text{CaLi}_5\text{SnSe}_3$) 216602-83-4,

Calcium lithium tin selenide (CaLi6SnSe3) 216602-84-5, Calcium lithium tin selenide (CaLi7SnSe3) 216602-85-6, Calcium lithium tin selenide (CaLi8SnSe3) 216602-86-7, Calcium lithium tin selenide (CaLi9SnSe3) 216602-87-8, Calcium lithium tin selenide (CaLi10SnSe3) 216602-88-9, Calcium lithium tin selenide (CaLi11SnSe3) 216602-89-0, Calcium lithium tin selenide (CaLi12SnSe3) 216602-90-3, Barium lithium tin telluride (BaLi0.1SnTe3) 216602-91-4, Barium lithium tin telluride (BaLi0.5SnTe3) 216602-92-5, Barium lithium tin telluride (BaLiSnTe3) 216602-93-6, Barium lithium tin telluride (BaLi2SnTe3) 216602-94-7, Barium lithium tin telluride (BaLi3SnTe3) 216602-95-8, Barium lithium tin telluride (BaLi4SnTe3) 216602-96-9, Barium lithium tin telluride (BaLi5SnTe3) 216602-97-0, Barium lithium tin telluride (BaLi6SnTe3) 216602-98-1, Barium lithium tin telluride (BaLi7SnTe3) 216602-99-2, Barium lithium tin telluride (BaLi8SnTe3) 216603-00-8, Barium lithium tin telluride (BaLi9SnTe3) 216603-01-9, Barium lithium tin telluride (BaLi10SnTe3) 216603-02-0, Barium lithium tin telluride (BaLi11SnTe3) 216603-03-1, Barium lithium tin telluride (BaLi12SnTe3)

RL: DEV (Device component use); PRP (Properties); USES (Uses)

(anode in high-performance **nonaq.**-electrolyte batteries)

IT 130811-82-4, Cobalt lithium manganese oxide (Co0.2Li Mn1.8O4)

RL: DEV (Device component use); USES (Uses)

(cathode in high-performance **nonaq.**-electrolyte batteries)

IT 11078-41-4, Aluminum strontium sulfide (Al2SrS4)

12396-71-3 86567-81-9 124358-93-6, Strontium

zinc sulfide (SrZnS2) 171067-34-8, Aluminum potassium sulfide

(AlKS2) 216598-91-3, Aluminum sodium sulfide (AlNaS2)

216598-98-0, Potassium zinc sulfide (K2ZnS2) 216599-01-8

, Aluminum sodium tin sulfide (Al2Na2SnS5) 216599-02-9, Aluminum

sodium sulfide thiosilicate (Al2Na2S(SiS4)) 216599-03-0,

Aluminum lead sodium sulfide (Al2PbNa2S5) 216599-04-1, Aluminum

cadmium sodium sulfide (Al2CdNa2S4) 216599-05-2, Aluminum

bismuth sodium sulfide (AlBiNa2S4) 216599-06-3, Aluminum indium

sodium sulfide (AlInNa2S3) 216599-07-4, Aluminum sodium zinc

sulfide (Al2Na2ZnS4) 216599-08-5, Aluminum gallium sodium

sulfide (AlGaNa2S3) 216599-09-6, Aluminum germanium sodium

sulfide (Al2GeNa2S4) 216599-10-9, Aluminum strontium tin sulfide

(Al3SrSnS5) 216599-16-5, Strontium tin zinc sulfide (SrSnZnS3)

216599-28-9, Aluminum calcium lead sulfide (Al2CaPbS5)

216599-34-7, Calcium lead zinc sulfide (CaPbZnS3)

216599-37-0, Aluminum cadmium calcium sulfide (Al2CdCaS4)

216599-42-7, Cadmium calcium zinc sulfide (CdCaZnS2)

216599-54-1, Aluminum indium potassium sulfide (AlInK2S4)

216599-60-9, Indium potassium zinc sulfide (In2K2ZnS5)

216599-67-6, Aluminum gallium strontium sulfide (AlGaSrS4)

216599-74-5, Gallium strontium zinc sulfide (Ga2SrZnS5)

216602-62-9, Calcium lithium tin sulfide (CaLi0.1SnS3)

216602-63-0, Calcium lithium tin sulfide (CaLi0.5SnS3)

216602-64-1, Calcium lithium tin sulfide (CaLiSnS3)

216602-65-2, Calcium lithium tin sulfide (CaLi2SnS3)

216602-66-3, Calcium lithium tin sulfide (CaLi3SnS3)

216602-67-4, Calcium lithium tin sulfide (CaLi4SnS3)

216602-68-5, Calcium lithium tin sulfide (CaLi5SnS3)

216602-69-6, Calcium lithium tin sulfide (CaLi6SnS3)

216602-70-9, Calcium lithium tin sulfide (CaLi7SnS3)

216602-71-0, Calcium lithium tin sulfide (CaLi8SnS3)

216602-72-1, Calcium lithium tin sulfide (CaLi9SnS3)

216602-73-2, Calcium lithium tin sulfide (CaLi10SnS3)

216602-74-3, Calcium lithium tin sulfide (CaLi11SnS3)

216602-75-4, Calcium lithium tin sulfide (CaLi12SnS3)

RL: DEV (Device component use); PRP (Properties); USES (Uses)

(anode in high-performance nonaq.-electrolyte
batteries)

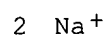
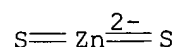
RN 11078-41-4 HCAPLUS

CN Aluminum strontium sulfide (Al₂SrS₄) (8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	4	7704-34-9
Sr	1	7440-24-6
Al	2	7429-90-5

RN 12396-71-3 HCAPLUS

CN Zincate(2-), dithioxo-, disodium (9CI) (CA INDEX NAME)



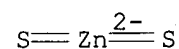
RN 86567-81-9 HCAPLUS

CN Aluminum calcium sulfide (Al₂CaS₄) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	4	7704-34-9
Ca	1	7440-70-2
Al	2	7429-90-5

RN 124358-93-6 HCAPLUS

CN Strontium zinc sulfide (SrZnS₂) (6CI, 9CI) (CA INDEX NAME)



RN 171067-34-8 HCAPLUS

CN Aluminum potassium sulfide (AlKS₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	2	7704-34-9
K	1	7440-09-7
Al	1	7429-90-5

RN 216598-91-3 HCAPLUS

CN Aluminum sodium sulfide (AlNaS₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	2	7704-34-9
Na	1	7440-23-5
Al	1	7429-90-5

RN 216598-98-0 HCAPLUS
 CN Potassium zinc sulfide (K₂ZnS₂) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	2	7704-34-9
Zn	1	7440-66-6
K	2	7440-09-7

RN 216599-01-8 HCAPLUS
 CN Aluminum sodium tin sulfide (Al₂Na₂SnS₅) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	5	7704-34-9
Sn	1	7440-31-5
Na	2	7440-23-5
Al	2	7429-90-5

RN 216599-02-9 HCAPLUS
 CN Aluminum sodium sulfide thiosilicate (Al₂Na₂S(SiS₄)) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S ₄ Si	1	51148-24-4
S	1	7704-34-9
Na	2	7440-23-5
Al	2	7429-90-5

RN 216599-03-0 HCAPLUS
 CN Aluminum lead sodium sulfide (Al₂PbNa₂S₅) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	5	7704-34-9
Na	2	7440-23-5
Pb	1	7439-92-1
Al	2	7429-90-5

RN 216599-04-1 HCAPLUS
 CN Aluminum cadmium sodium sulfide (Al₂CdNa₂S₄) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	4	7704-34-9
Cd	1	7440-43-9
Na	2	7440-23-5
Al	2	7429-90-5

RN 216599-05-2 HCAPLUS
 CN Aluminum bismuth sodium sulfide (AlBiNa2S4) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	4	7704-34-9
Bi	1	7440-69-9
Na	2	7440-23-5
Al	1	7429-90-5

RN 216599-06-3 HCAPLUS
 CN Aluminum indium sodium sulfide (AlInNa2S3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	3	7704-34-9
In	1	7440-74-6
Na	2	7440-23-5
Al	1	7429-90-5

RN 216599-07-4 HCAPLUS
 CN Aluminum sodium zinc sulfide (Al2Na2ZnS4) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	4	7704-34-9
Zn	1	7440-66-6
Na	2	7440-23-5
Al	2	7429-90-5

RN 216599-08-5 HCAPLUS
 CN Aluminum gallium sodium sulfide (AlGaNa2S3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	3	7704-34-9
Ga	1	7440-55-3
Na	2	7440-23-5
Al	1	7429-90-5

RN 216599-09-6 HCAPLUS
 CN Aluminum germanium sodium sulfide (Al2GeNa2S4) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	4	7704-34-9
Ge	1	7440-56-4
Na	2	7440-23-5
Al	2	7429-90-5

RN 216599-10-9 HCAPLUS
 CN Aluminum strontium tin sulfide (Al3SrSnS5) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
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Component	Ratio	Component Registry Number
S	5	7704-34-9
Sn	1	7440-31-5
Sr	1	7440-24-6
Al	3	7429-90-5

RN 216599-16-5 HCAPLUS

CN Strontium tin zinc sulfide (SrSnZnS3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	3	7704-34-9
Zn	1	7440-66-6
Sn	1	7440-31-5
Sr	1	7440-24-6

RN 216599-28-9 HCAPLUS

CN Aluminum calcium lead sulfide (Al2CaPbS5) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	5	7704-34-9
Ca	1	7440-70-2
Pb	1	7439-92-1
Al	2	7429-90-5

RN 216599-34-7 HCAPLUS

CN Calcium lead zinc sulfide (CaPbZnS3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	3	7704-34-9
Ca	1	7440-70-2
Zn	1	7440-66-6
Pb	1	7439-92-1

RN 216599-37-0 HCAPLUS

CN Aluminum cadmium calcium sulfide (Al2CdCaS4) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	4	7704-34-9
Ca	1	7440-70-2
Cd	1	7440-43-9
Al	2	7429-90-5

RN 216599-42-7 HCAPLUS

CN Cadmium calcium zinc sulfide (CdCaZnS2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	2	7704-34-9
Ca	1	7440-70-2
Zn	1	7440-66-6
Cd	1	7440-43-9

RN 216599-54-1 HCAPLUS
CN Aluminum indium potassium sulfide (AlInK2S4) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	4	7704-34-9
In	1	7440-74-6
K	2	7440-09-7
Al	1	7429-90-5

RN 216599-60-9 HCAPLUS
CN Indium potassium zinc sulfide (In2K2ZnS5) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	5	7704-34-9
In	2	7440-74-6
Zn	1	7440-66-6
K	2	7440-09-7

RN 216599-67-6 HCAPLUS
CN Aluminum gallium strontium sulfide (AlGaSrS4) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	4	7704-34-9
Ga	1	7440-55-3
Sr	1	7440-24-6
Al	1	7429-90-5

RN 216599-74-5 HCAPLUS
CN Gallium strontium zinc sulfide (Ga2SrZnS5) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	5	7704-34-9
Zn	1	7440-66-6
Ga	2	7440-55-3
Sr	1	7440-24-6

RN 216602-62-9 HCAPLUS
CN Calcium lithium tin sulfide (CaLi0.1SnS3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	3	7704-34-9
Ca	1	7440-70-2
Sn	1	7440-31-5
Li	0.1	7439-93-2

RN 216602-63-0 HCAPLUS
CN Calcium lithium tin sulfide (CaLi0.5SnS3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	3	7704-34-9
Ca	1	7440-70-2
Sn	1	7440-31-5
Li	0.5	7439-93-2

S		3		7704-34-9
Ca		1		7440-70-2
Sn		1		7440-31-5
Li		0.5		7439-93-2

RN 216602-64-1 HCAPLUS

CN Calcium lithium tin sulfide (CaLiSnS3) (9CI) (CA INDEX NAME)

Component		Ratio		Component Registry Number
S		3		7704-34-9
Ca		1		7440-70-2
Sn		1		7440-31-5
Li		1		7439-93-2

RN 216602-65-2 HCAPLUS

CN Calcium lithium tin sulfide (CaLi2SnS3) (9CI) (CA INDEX NAME)

Component		Ratio		Component Registry Number
S		3		7704-34-9
Ca		1		7440-70-2
Sn		1		7440-31-5
Li		2		7439-93-2

RN 216602-66-3 HCAPLUS

CN Calcium lithium tin sulfide (CaLi3SnS3) (9CI) (CA INDEX NAME)

Component		Ratio		Component Registry Number
S		3		7704-34-9
Ca		1		7440-70-2
Sn		1		7440-31-5
Li		3		7439-93-2

RN 216602-67-4 HCAPLUS

CN Calcium lithium tin sulfide (CaLi4SnS3) (9CI) (CA INDEX NAME)

Component		Ratio		Component Registry Number
S		3		7704-34-9
Ca		1		7440-70-2
Sn		1		7440-31-5
Li		4		7439-93-2

RN 216602-68-5 HCAPLUS

CN Calcium lithium tin sulfide (CaLi5SnS3) (9CI) (CA INDEX NAME)

Component		Ratio		Component Registry Number
S		3		7704-34-9
Ca		1		7440-70-2
Sn		1		7440-31-5
Li		5		7439-93-2

RN 216602-69-6 HCAPLUS

CN Calcium lithium tin sulfide (CaLi6SnS3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	3	7704-34-9
Ca	1	7440-70-2
Sn	1	7440-31-5
Li	6	7439-93-2

RN 216602-70-9 HCAPLUS

CN Calcium lithium tin sulfide (CaLi7SnS3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	3	7704-34-9
Ca	1	7440-70-2
Sn	1	7440-31-5
Li	7	7439-93-2

RN 216602-71-0 HCAPLUS

CN Calcium lithium tin sulfide (CaLi8SnS3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	3	7704-34-9
Ca	1	7440-70-2
Sn	1	7440-31-5
Li	8	7439-93-2

RN 216602-72-1 HCAPLUS

CN Calcium lithium tin sulfide (CaLi9SnS3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	3	7704-34-9
Ca	1	7440-70-2
Sn	1	7440-31-5
Li	9	7439-93-2

RN 216602-73-2 HCAPLUS

CN Calcium lithium tin sulfide (CaLi10SnS3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	3	7704-34-9
Ca	1	7440-70-2
Sn	1	7440-31-5
Li	10	7439-93-2

RN 216602-74-3 HCAPLUS

CN Calcium lithium tin sulfide (CaLi11SnS3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	3	7704-34-9

Ca		1		7440-70-2
Sn		1		7440-31-5
Li		11		7439-93-2

RN 216602-75-4 HCAPLUS
 CN Calcium lithium tin sulfide (CaLi12SnS3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
S	3	7704-34-9
Ca	1	7440-70-2
Sn	1	7440-31-5
Li	12	7439-93-2

L21 ANSWER 23 OF 42 HCAPLUS COPYRIGHT 2001 ACS

AN 1998:631377 HCAPLUS

DN 129:247643

TI **Nonaqueous** electrolyte batteries and their manufacture

IN Matsui, Toru; Takeyama, Kenichi; Nakagiri, Yasushi; Kawai, Tetsuya

PA Matsushita Electric Industrial Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01M010-40

ICS H01M004-02

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10255845	A2	19980925	JP 1997-55966	19970311

AB The batteries have a **cathode**, an alkali ion conductive electrolyte, and an alkali metal **anode**, where the **anode** has a salt sol. in **battery** electrolyte attached on its surface or included inside the **anode**. The batteries are prepd. by adding the salt to the **anode** and releasing the salt to the electrolyte during charge discharge cycles.

ST alkali metal **battery anode** electrolyte salt

IT Battery anodes

Battery electrolytes

Lithium secondary batteries

(lithium anodes contg. attached electrolyte slat particles for batteries)

IT 2923-17-3, Lithium trifluoroacetate 7439-93-2, Lithium, uses 7791-03-9, Lithium perchlorate 14283-07-9, Lithium fluoroborate 21324-40-3, Lithium hexafluorophosphate 33454-82-9, Lithium trifluoromethanesulfonate 90076-65-6 **132404-42-3**

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)

(lithium anodes contg. attached electrolyte slat particles for batteries)

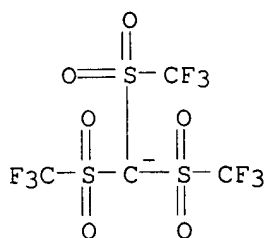
IT **132404-42-3**

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)

(lithium anodes contg. attached electrolyte slat particles for batteries)

RN 132404-42-3 HCAPLUS

CN Methane, tris[(trifluoromethyl)sulfonyl]-, ion(1-), lithium (9CI) (CA INDEX NAME)



● Li⁺

L21 ANSWER 24 OF 42 HCAPLUS COPYRIGHT 2001 ACS

AN 1998:509379 HCAPLUS

DN 129:191547

TI **Nonaqueous**-electrolyte lithium secondary battery having high discharge capacity

IN Nagata, Mikito; Karril, Amin; Tsukamoto, Kotobuki

PA Japan Storage Battery Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01M004-02

ICS H01M004-58; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10208730	A2	19980807	JP 1997-25985	19970124

AB In the title **battery**, **cathode** contains a Li-contg.

metal oxide as an active mass and another substance having Li⁺-discharging potential higher than that of the metal oxide and of amt. corresponding to an amt. of Li⁺ consumed in the initial charging. Preferably, the substance is selected from Li_{1+x}Mn₂O₄ (X = 0-1), Li₂NiO₂, LiMnO₂, Li₂Mn_{2-x}MxO₄ (M = Co, Ni, Zn, Mg, Fe; X = 0-2), Li₂Mn_{1.5}Ni_{0.5}O₄, Li_xVO₃ (X = 1-6), Li₃Fe₂(PO₄)₃, Li₃Fe₂(SO₄)₃, Li₃FeV(PO₄)₃, and Li₃V(PO₄)₃.

Anode in the **battery** may be selected from graphite, coke, (amorphous) carbon, SnO, SnO₂, Sn_{1-x}MxO (M = Hg, P, B, Si, Ge Sb; 0 .ltoreq. X < 1), Sn_{1-x}MxO₂ (M = Hg, P, B, Si, Ge, Sb; 0 .ltoreq. X < 1), Sn₃O₂(OH)₂, Sn_{3-x}MxO₂(OH)₂ (M = Mg, P, B, Si, Ge, Sb, As, Mn; 0 .ltoreq. X < 3), LiSiO₂, SiO₂, and LiSnO₂. Lack of Li⁺ consumed in formation of a surficial film on the **anode** and Li⁺ trapped in the **anode** both occurring in the initial charging is supplemented by the substance.

ST lithium **battery cathode** lithium ion supplier;

anode oxide lithium **battery**; tin oxide **anode**

lithium **battery**; coke **anode** lithium **battery**;

silica **anode** lithium **battery**

IT Battery cathodes

(Li secondary batteries with cathodes contg. Li metal oxide and Li⁺ supplier additives)

IT Coke

RL: DEV (Device component use); USES (Uses)

(**anode**; Li secondary batteries with cathodes contg. Li metal

oxide and Li+ supplier additives)

IT Battery anodes
(oxide; Li secondary batteries with cathodes contg. Li metal oxide and Li+ supplier additives)

IT 7440-44-0, Carbon, uses 7631-86-9, Silica, uses 7782-42-5, Graphite, uses 18282-10-5, Tin oxide (SnO₂) 21651-19-4, Tin oxide (SnO) 39432-42-3, Tin hydroxide oxide Sn₃(OH)₂O₂ 186448-61-3, Lithium oxide silicide (Li₂O₂Si) 211753-60-5, Lithium tin oxide (LiSnO₂)
RL: DEV (Device component use); USES (Uses)
(**anode**; Li secondary batteries with cathodes contg. Li metal oxide and Li+ supplier additives)

IT 12057-17-9, Lithium manganese oxide (LiMn₂O₄) 12162-79-7, Lithium manganese oxide (LiMnO₂) 12325-84-7, Lithium nickel oxide (Li₂NiO₂) 36058-25-0, Lithium iron phosphate [Li₃Fe₂(PO₄)₃] 123550-86-7, Lithium manganese oxide (Li_{0.5}-1MnO₂) 186131-68-0, Iron lithium vanadium phosphate (FeLi₃V(PO₄)₃) 200938-46-1, Lithium manganese nickel oxide (Li₂Mn_{1.5}Ni_{0.5}O₄) 211753-57-0, Lithium vanadium oxide (Li₁-6VO₃) **211753-58-1**, Iron lithium sulfate (Fe₂Li₃(SO₄)₃) 211753-59-2, Lithium vanadium phosphate (Li₃V(PO₄)₃)
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(lithium ion supplier in cathode; Li secondary batteries with cathodes contg. Li metal oxide and Li+ supplier additives)

IT **211753-58-1**, Iron lithium sulfate (Fe₂Li₃(SO₄)₃)
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(lithium ion supplier in cathode; Li secondary batteries with cathodes contg. Li metal oxide and Li+ supplier additives)

RN 211753-58-1 HCAPLUS

CN Iron lithium sulfate (Fe₂Li₃(SO₄)₃) (9CI) (CA INDEX NAME)

Component	Ratio	Component	Registry Number
O4S	3		14808-79-8
Li	3		7439-93-2
Fe	2		7439-89-6

L21 ANSWER 25 OF 42 HCAPLUS COPYRIGHT 2001 ACS

AN 1998:496162 HCAPLUS

DN 129:138523

TI Anodes for secondary lithium batteries and the batteries

IN Yoshimura, Seiji; Kusumoto, Yasuyuki; Yanai, Atsushi; Noma, Toshiyuki; Nishio, Akiji

PA Sanyo Electric Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01M004-02

ICS H01M004-04; H01M010-40

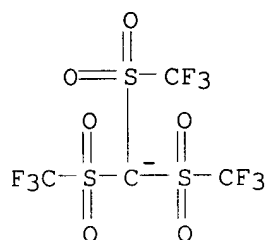
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10199510	A2	19980731	JP 1997-2483	19970110
AB	The anodes use halogen gas treated Li as active mass. The batteries use the halogen treated Li as anode active mass or use untreated Li as anode mass and a nonaq. electrolyte contg. dissolved halogen. Batteries using these electrodes have high charge				

discharge efficiency and long cycle life.

ST **battery anode** halogen treated lithium
IT Battery anodes
(halogen treated lithium anodes for secondary lithium batteries)
IT 96-48-0, .gamma.-Butyrolactone 96-49-1, Ethylene carbonate 105-58-8,
Diethyl carbonate 108-32-7, Propylene carbonate 109-99-9, Thf, uses
126-33-0, Sulfolan 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl
carbonate 646-06-0, 1,3-Dioxolan 4437-85-8, Butylene carbonate
14283-07-9, Lithium fluoroborate 21324-40-3, Lithium hexafluorophosphate
29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium
trifluoromethanesulfonate 90076-65-6 **132404-42-3**
RL: DEV (Device component use); USES (Uses)
(electrolyte solns. contg. dissolved halogen for treating lithium
anodes in secondary lithium batteries)
IT 7439-93-2, Lithium, uses 7440-44-0, Carbon, uses 12798-95-7
RL: DEV (Device component use); PEP (Physical, engineering or chemical
process); PROC (Process); USES (Uses)
(halogen treated lithium anodes for secondary lithium batteries)
IT 7782-41-4, Fluorine, uses 7782-50-5, Chlorine, uses
RL: NUU (Nonbiological use, unclassified); USES (Uses)
(halogen treated lithium anodes for secondary lithium batteries)
IT **132404-42-3**
RL: DEV (Device component use); USES (Uses)
(electrolyte solns. contg. dissolved halogen for treating lithium
anodes in secondary lithium batteries)
RN 132404-42-3 HCAPLUS
CN Methane, tris[(trifluoromethyl)sulfonyl]-, ion(1-), lithium (9CI) (CA
INDEX NAME)



● Li⁺

L21 ANSWER 26 OF 42 HCAPLUS COPYRIGHT 2001 ACS
AN 1998:474026 HCAPLUS
DN 129:151119
TI Secondary **nonaqueous**-electrolyte battery
IN Ito, Shuji; Murata, Toshihide; Bito, Yasuhiko; Toyoguchi, Yoshinori
PA Matsushita Electric Industrial Co., Ltd., Japan
SO Eur. Pat. Appl., 51 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM H01M004-62
ICS H01M004-48; H01M004-58
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 853347	A1	19980715	EP 1997-122297	19971217
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 10255796	A2	19980925	JP 1997-54947	19970310
	JP 10233208	A2	19980902	JP 1997-163285	19970604
	US 6124057	A	20000926	US 1997-993735	19971218
PRAI	JP 1996-341012	A	19961220		
	JP 1997-54947	A	19970310		
	JP 1997-163285	A	19970604		
AB	The anode active material of the title battery having a high capacity and excellent cycling characteristics comprises a salt of a metal or a semimetal and a compd. selected from the oxo acids, HSCN, NCCN, and HCNO, where each oxo acid comprises an element selected N, S, C, B, P, Se, Te, W, Mo, Ti, Cr, Zr, Nb, Ta, Mn, and V, the salts of the oxo acids of P and B being restricted to hydrogen phosphates and hydrogen borates.				
ST	nonaq electrolyte battery anode metal salt; semimetal salt nonaq electrolyte battery anode ; oxo acid salt battery anode ; thiocyanic acid salt battery anode ; cyanogen salt battery anode ; cyanic acid salt battery anode				
IT	Secondary batteries (high-performance lithium-ion)				
IT	Phosphates, uses Sulfates, uses RL: DEV (Device component use); USES (Uses) (hydrogen, metal and semimetal; anode active material for lithium-ion batteries)				
IT	Bicarbonates Borates Carbonates, uses Chromates Cyanates Cyanides (inorganic), uses Manganates Molybdates Nitrates, uses Nitrites Phosphates, uses Selenates Selenites Sulfates, uses Sulfites Thiocyanates Thiosulfates Titanates Zirconates RL: DEV (Device component use); USES (Uses) (metal and semimetal; anode active material for lithium-ion batteries)				
IT	Group VB element compounds RL: DEV (Device component use); USES (Uses) (niobates, metal and semimetal; anode active material for lithium-ion batteries)				
IT	Battery anodes (of metal or semimetal salts of cyanic acid or cyanogen or oxo acids or thiocyanic acid)				
IT	Group VB element compounds				

RL: DEV (Device component use); USES (Uses)
 (tantalates, metal and semimetal; **anode** active material for lithium-ion batteries)

IT Group VIA element compounds
 RL: DEV (Device component use); USES (Uses)
 (tellurates, metal and semimetal; **anode** active material for lithium-ion batteries)

IT Group VB element compounds
 RL: DEV (Device component use); USES (Uses)
 (vanadates, metal and semimetal; **anode** active material for lithium-ion batteries)

IT 306-61-6, Magnesium thiocyanate 471-34-1, Calcium carbonate, uses 513-77-9, Barium carbonate 513-78-0, Cadmium carbonate 513-79-1, Cobalt carbonate CoCO_3 538-17-0, Aluminum thiocyanate 542-62-1, Barium cyanide 542-83-6, Cadmium cyanide 542-84-7, Cobalt cyanide $(\text{Co}(\text{CN})_2)$ 546-93-0, Magnesium carbonate 557-19-7, Nickel cyanide $(\text{Ni}(\text{CN})_2)$ 557-21-1, Zinc cyanide 557-42-6, Zinc thiocyanate 563-71-3, Ferrous carbonate 592-01-8, Calcium cyanide 592-05-2, Lead cyanide $\text{Pb}(\text{CN})_2$ 592-87-0, Lead thiocyanate 598-62-9, Manganese carbonate 598-63-0, Lead carbonate 865-38-3, Cadmium thiocyanate 1184-64-1, Cupric carbonate 1633-05-2, Strontium carbonate 1948-47-6, Iron cyanide $(\text{Fe}(\text{CN})_2)$ 2090-64-4, Magnesium bicarbonate 2092-16-2, Calcium thiocyanate 2092-17-3, Barium thiocyanate 2768-97-0, Indium thiocyanate 3017-60-5 3227-61-0 3227-62-1 3251-23-8, Cupric nitrate 3333-67-3, Nickel carbonate 3486-35-9, Zinc carbonate 3602-20-8, Tin thiocyanate 3999-98-2 4100-56-5, Magnesium cyanide 4367-08-2, Copper cyanide $(\text{Cu}(\text{CN})_2)$ 4756-59-6 4756-65-4, Aluminum isocyanate 5702-63-6, Stibinetri-carbonitrile 6010-09-9 6449-00-9, Chromium carbonate $\text{Cr}_2(\text{CO}_3)_3$ 6860-10-2, Calcium dicyanate 7446-10-8, Lead sulfite PbSO_3 7446-14-2, Lead sulfate 7446-15-3 **7487-88-9**, Magnesium sulfate, uses 7488-51-9 7488-55-3 7720-78-7, Ferrous sulfate 7727-43-7, Barium sulfate **7733-02-0**, Zinc sulfate 7757-86-0 **7757-88-2**, Magnesium sulfite 7757-95-1, Nickel sulfite NiSO_3 7758-97-6, Lead chromate PbCrO_4 **7758-98-7**, Copper sulfate, uses 7759-00-4 7759-01-5, Lead tungsten oxide (PbWO_4) 7759-02-6, Strontium sulfate 7778-18-9, Calcium sulfate **7779-86-4** 7779-88-6, Zinc nitrate 7784-22-7 7785-87-7, Manganese sulfate 7786-81-4, Nickel sulfate 7787-39-5, Barium sulfite 7787-41-9 7787-68-0, Bismuth sulfate 7789-14-2 7789-82-4, Calcium molybdate CaMoO_4 7790-75-2, Calcium tungsten oxide (CaWO_4) 7790-83-2 7790-85-4, Cadmium tungsten oxide (CdWO_4) 10022-31-8, Barium nitrate 10026-23-0 **10028-26-9** 10031-38-6 10042-76-9, Strontium nitrate **10043-01-3**, Aluminum sulfate $\text{Al}_2(\text{SO}_4)_3$ 10048-98-3 10099-74-8 10099-79-3, Lead vanadium oxide (PbV_2O_6) 10101-53-8, Chromium sulfate 10101-96-9 10102-02-0, Zinc nitrite 10124-36-4, Cadmium sulfate 10124-37-5, Calcium nitrate 10124-43-3, Cobalt sulfate **10124-53-5** 10141-05-6 10174-28-4, Chromium tin oxide (CrSnO_4) 10190-55-3, Lead molybdenum oxide (PbMoO_4) 10214-40-1 10257-55-3, Calcium sulfite 10294-58-3 10325-94-7 10343-61-0, Titanium sulfate $\text{Ti}_2(\text{SO}_4)_3$ 10361-44-1 10377-57-8 10377-60-3, Magnesium nitrate 10377-66-9 11093-84-8, Indium titanium oxide (In_2TiO_5) 11120-61-9, Chromium tin oxide (CrSn_2O_6) 12013-45-5, Calcium niobium oxide (CaNb_2O_6) 12013-47-7, Calcium zirconium oxide (CaZrO_3) 12013-95-5, Cadmium chromium oxide (CdCr_2O_4) 12014-14-1, Cadmium titanium oxide (CdTiO_3) 12025-16-0, Germanium manganese oxide (GeMnO_3) 12032-31-4, Magnesium zirconium oxide (MgZrO_3) 12034-88-7, Lead niobium oxide (PbNb_2O_6) 12034-89-8, Niobium strontium oxide (Nb_2SrO_6) 12036-39-4, Strontium zirconium oxide (SrZrO_3) 12036-43-0, Titanium zinc oxide (TiZnO_3) 12048-51-0, Bismuth titanium oxide ($\text{Bi}_2\text{Ti}_2\text{O}_7$) 12048-52-1, Bismuth zirconium oxide ($\text{Bi}_2\text{Zr}_3\text{O}_9$) 12050-35-0, Cadmium tantalum oxide ($\text{Cd}_2\text{Ta}_2\text{O}_7$) 12056-04-1, Indium tantalum oxide (InTaO_4) 12058-23-0, Molybdenum tin

oxide (Mo₂SnO₈) 12059-64-2, Lead niobium oxide (Pb₂Nb₂O₇) 12060-00-3, Lead titanate PbTiO₃ 12060-01-4, Lead zirconium oxide (PbZrO₃) 12064-15-2, Gallium manganese oxide (Ga₂MnO₄) 12065-82-6, Lead tantalum oxide (Pb₂Ta₂O₇) 12138-50-0, Calcium tungsten oxide (CaWO₃) 12139-18-3, Cadmium manganese oxide (CdMnO₃) 12139-23-0, Cadmium zirconium oxide (CdZrO₃) 12143-37-2, Strontium tungsten oxide (SrWO₃) 12143-52-1, Lead oxide selenate (Pb₂O(SeO₄)) 12160-57-5, Gallium niobium oxide (GaNbO₄) 12163-26-7, Magnesium niobium oxide (MgNb₂O₆) 12163-45-0, Manganese strontium oxide (MnSrO₃) 12169-18-5, Zinc zirconium oxide (ZnZrO₃) 12169-20-9, Antimony tantalum oxide (SbTaO₄) 12177-86-5, Calcium manganese oxide (CaMnO₃) 12187-14-3, Cadmium niobium oxide (Cd₂Nb₂O₇) 12201-66-0, Niobium zinc oxide (Nb₂ZnO₆) 12209-35-7, Manganese tin oxide (MnSnO₃) 12209-43-7, Manganese tin oxide (Mn₂SnO₄) 12232-83-6, Bismuth chromium oxide (BiCrO₃) 12251-86-4, Aluminum tantalum oxide (AlTaO₄) 12258-25-2, Aluminum niobium oxide (AlNbO₄) 12272-28-5, Bismuth niobium oxide (BiNbO₄) 12272-29-6, Bismuth tantalum oxide (BiTaO₄) 12274-06-5, Manganese zinc oxide (MnZnO₃) 12292-47-6, Chromium indium oxide (CrInO₃) 12311-81-8, Antimony vanadium oxide (SbVO₄) 12337-20-1, Lead titanium oxide (PbTi₃O₇) 12340-07-7, Lead tungsten oxide (PbWO₃) 12362-92-4, Niobium tin oxide (Nb₂SnO₆) 12362-93-5, Niobium tin oxide (Nb₂Sn₂O₇) 12363-22-3, Tantalum tin oxide (Ta₂Sn₂O₇) 12378-52-8, Gallium tantalum oxide (GaTaO₄) 12379-00-9, Indium niobium oxide (InNbO₄) 12421-98-6, Calcium tantalum oxide (Ca₂Ta₂O₇) 12438-49-2, Magnesium tantalum oxide (Mg₂Ta₂O₇) 12438-60-7, Lead manganese oxide (PbMnO₃) 12440-09-4, Strontium tantalum oxide (Sr₂Ta₂O₇) 12501-29-0, Tellurium tin oxide (Te₃SnO₈) 12588-16-8, Aluminum chromium oxide (AlCrO₃) 12600-76-9, Tin zirconium oxide (SnZrO₃) 13074-68-5, Indium cyanide In(CN)₃ 13092-66-5 13138-45-9, Nickel nitrate 13450-99-2 13451-01-9 13451-02-0, Strontium sulfite 13451-05-3, Strontium tungsten oxide (SrWO₄) 13453-58-2 13453-65-1 13464-82-9 13466-24-5 13468-91-2, Lead carbonate (Pb(HCO₃)₂) 13470-04-7, Strontium molybdate SrMoO₄ 13473-90-0, Aluminum nitrate 13477-23-1, Cadmium sulfite CdSO₃ 13478-08-5 13478-50-7 13494-90-1, Gallium nitrate 13494-91-2, Gallium sulfate Ga₂(SO₄)₃ 13530-50-2 13530-54-6 13530-56-8, Aluminum vanadium oxide (AlVO₄) 13530-65-9, Zinc chromate 13566-06-8, Vanadium sulfate VSO₄ 13568-71-3, Manganese sulfite 13573-11-0, Magnesium tungsten oxide (MgWO₄) 13573-13-2, Magnesium vanadium oxide (MgV₂O₆) 13587-24-1 13595-85-2, Bismuth molybdenum oxide (Bi₂Mo₃O₁₂) 13595-86-3, Bismuth tungsten oxide (Bi₂WO₆) 13595-87-4, Bismuth tungsten oxide (Bi₂W₃O₁₂) 13596-21-9 **13597-44-9**, Zinc sulfite 13597-46-1 13597-54-1 13597-56-3, Tungsten zinc oxide (WZnO₄) 13597-58-5, Strontium vanadium oxide (SrV₂O₆) 13598-37-3 13654-05-2 13689-92-4 13709-68-7 13718-59-7 13767-03-8, Magnesium molybdate MgMoO₄ 13767-32-3, Zinc molybdate ZnMoO₄ 13770-61-1 **13773-83-6 13774-25-9** 13780-03-5 13780-18-2 13814-56-7 13814-58-9 13814-59-0 13814-62-5 **13819-17-5** 13826-65-8 13826-70-5, Tin nitrate Sn(NO₃)₄ **13845-15-3** 13845-35-7 13847-12-6 13860-02-1 13912-55-5 13972-68-4, Cadmium molybdenum oxide (CdMoO₄) 13977-75-8 **14013-02-6**, Copper sulfite CuSO₃ 14013-86-6, Ferrous nitrate 14019-91-1 14047-62-2, Aluminum nitrite Al(NO₂)₃ 14059-33-7, Bismuth vanadium oxide (BiVO₄) 14067-62-0 14312-01-7 14332-25-3 14332-34-4 14332-39-9 14332-59-3 14332-60-6 14355-35-2 14373-77-4 14455-29-9

RL: DEV (Device component use); USES (Uses)
 (anode active material for lithium-ion batteries)

IT 14553-36-7, Tin tungsten oxide (SnWO₄) 14590-19-3 **14590-34-2** 14590-38-6 14684-12-9 14696-77-6 14986-91-5 15060-62-5 15060-64-7 15070-34-5, Magnesium nitrite 15123-69-0 15123-80-5, Aluminum molybdate Al₂(MoO₄)₃ 15123-82-7, Aluminum tungsten oxide (Al₂W₃O₁₂) 15123-95-2 15191-99-8 15192-76-4 15320-45-3, Gallium

vanadium oxide (GaVO₄) **15457-98-4** 15469-59-7, Vanadium zinc
 oxide (V₂ZnO₆) 15514-01-9, Indium molybdenum oxide (In₂Mo₃O₁₂)
 15571-83-2, Indium tungsten oxide (In₂W₃O₁₂) 15593-61-0
15593-64-3 **15593-67-6** 15600-69-8 15600-84-7
 15702-34-8 15702-36-0 15730-53-7 15845-52-0 15852-05-8
 15852-08-1 15852-09-2 15852-10-5 15852-13-8 15852-14-9
 15852-18-3 15852-19-4 15852-20-7 15852-21-8 15857-43-9
 16056-72-7, Cadmium vanadium oxide (CdV₂O₆) 16180-04-4 16508-95-5,
 Bismuth carbonate 16714-74-2, Tin vanadium oxide (SnV₂O₆) 16726-63-9
 16834-09-6 16890-98-5 16905-09-2, Antimony manganese oxide (Sb₂MnO₄)
 17153-86-5 17695-54-4 17740-80-6 18141-06-5 18488-89-6
 18496-31-6 18496-38-3 18515-86-1 18526-81-3 18659-67-1
 18725-92-3 18807-10-8 **18808-44-1** 18864-85-2 18864-86-3
 19028-20-7 19307-28-9, Tin sulfate Sn(SO₄)₂ 19853-03-3 20003-91-2,
 Gallium tungsten oxide (Ga₂W₃O₁₂) 20021-44-7 20328-96-5, Antimony
 nitrate 20403-34-3 20943-22-0 20960-64-9 20960-79-6 22400-99-3,
 Manganese cyanide Mn(CN)₂ 22620-90-2 22755-27-7 23276-62-2
 23377-49-3 23484-38-0, Indium vanadium oxide (InVO₄) 23665-02-3
 24283-38-3, Tin tungsten oxide (SnW₂O₈) 24468-27-7 24468-29-9
24738-38-3 25105-31-1 25268-69-3 25327-03-1 25599-25-1
 31754-55-9 31967-38-1 32702-66-2, Cobalt sulfite 34045-16-4,
 Chromium oxide silicate (Cr₂O₄(SiO₄)) 35387-42-9 35600-19-2, Antimony
 niobium oxide (SbNbO₄) 35667-77-7, Tin cyanide Sn(CN)₂ 37205-75-7,
 Antimony titanium oxide (Sb₃Ti₂O₁₀) 37322-77-3, Indium manganese oxide
 (In₂MnO₄) 37368-61-9, Bismuth titanium oxide (Bi₂TiO₅) 38150-63-9
 38150-64-0 39422-66-7, Magnesium manganese oxide (MgMnO₃) 39491-81-1
 39712-38-4 **40549-31-3**, Aluminum sulfite Al₂(SO₃)₃ 42133-30-2
 43384-63-0, Bismuth thiocyanate 43384-99-2, Gallium thiocyanate
 43636-19-7 **44120-46-9** 44121-71-3 **44122-15-8**
 45189-55-7 50787-80-9 50787-82-1 50787-84-3 50820-24-1, Ferrous
 sulfite 51306-12-8 51370-43-5, Silanetetracarbonitrile
51379-94-3 52014-18-3, Antimony manganese oxide (Sb₂MnO₆)
 52014-36-5, Tin titanate SnTiO₄ 52236-42-7 **52435-34-4**
52435-47-9 52478-60-1 53237-26-6, Antimony molybdenum oxide
 (Sb₂Mo₃O₁₂) 53411-67-9 53851-21-1, Aluminum tungsten oxide (AlW₂O₄)
 54250-24-7, Tantalum zinc oxide (Ta₂Zn₂O₇) 54590-02-2, Barium dicyanate
 54828-73-8, Gallium molybdenum oxide (Ga₂Mo₃O₁₂) 55135-61-0 55145-88-5
 55306-22-4, Chromium cyanide (Cr(CN)₃) 55927-25-8 56451-24-2, Indium
 vanadium oxide (In₂VO₅) 56627-48-6, Tin tungsten oxide (Sn₂W₃O₈)
 57538-97-3, Molybdenum cyanide (Mo(CN)₃) 59178-46-0 60459-04-3, Indium
 carbonate 60459-05-4 60492-87-7, Strontium titanium oxide (SrTiO₄)
 60763-29-3 **60994-15-2** 60994-16-3 61179-70-2, Bismuth
 manganese oxide (Bi₂MnO₄) 61737-93-7 62196-27-4 64789-76-0
 64896-84-0, Germanium thiocyanate 66903-62-6 66903-65-9 66904-06-1
 66906-87-4 67615-66-1 67615-67-2 67627-35-4 70692-95-4, Aluminum
 zirconium oxide (Al₂Zr₃O₉) **71070-32-1** 71449-76-8 71456-91-2,
 Titanium cyanide Ti(CN)₃ 71520-17-7 71567-97-0 **71843-93-1**
 71896-27-0, Bismuth sulfite 72296-38-9, Molybdenum tin oxide (MoSnO₄)
 74421-56-0 77835-83-7 85450-13-1 86494-88-4 86893-88-1
 87993-97-3, Aluminum cyanide Al(CN)₃ 88878-19-7 89161-76-2
91648-98-5 91785-92-1 91864-03-8 93805-27-7 94238-22-9
 95925-37-4 97187-09-2 97631-71-5 97994-52-0, Germanium cyanide
 99996-23-3 99996-26-6 **100434-82-0** 100436-77-9 100737-00-6
 100737-27-7 **100737-52-8** **101059-22-7** 105564-68-9
 107630-45-5 107630-54-6 108064-26-2 111233-81-9 115010-02-1
 115444-60-5 118131-59-2 118150-53-1 118832-97-6 118833-31-1
 121526-85-0, Bismuthinetricarbonitrile **121814-63-9**
 121835-89-0, Vanadium oxide silicate (VO_{1.5}(SiO₄)_{0.5}) 127324-46-3
 128783-39-1 130263-24-0 130263-26-2 141982-08-3 148523-56-2,
 Indium zirconium oxide (In_{0.8}Zr_{1.2}O_{3.6}) 149690-55-1 153584-46-4,
 Bismuth vanadium oxide (Bi₂VO₅) 154662-00-7, Calcium vanadium oxide

(Ca0.5VO3) 157170-26-8 162257-57-0, Indium molybdenum oxide (InMo4O6)
163119-07-1 173979-77-6, Magnesium tungsten oxide (MgWO3)
 182288-58-0 190017-27-7, Gallium cyanide Ga(CN)3 201029-73-4
 202004-37-3 202004-38-4 202004-39-5 202862-74-6, Zirconium silicate
 (Zr0.5(SiO4)0.5) 206182-17-4 210893-05-3 210893-06-4 210893-07-5
 210893-08-6 210893-09-7 210893-10-0 210893-11-1, Manganese tin
 nitrate (Mn0.22Sn0.78(NO3)2) 210893-12-2 210893-13-3, Iron tin nitrate
 (Fe0.12Sn0.88(NO3)2) 210893-14-4, Cobalt tin nitrate
 (Co0.18Sn0.82(NO3)2) 210893-15-5, Copper tin nitrate
 (Cu0.18Sn0.82(NO3)2) 210893-16-6, Tin titanium nitrate
 (Sn0.82Ti0.12(NO3)2)

RL: DEV (Device component use); USES (Uses)

(anode active material for lithium-ion batteries)

IT 210893-17-7, Chromium tin nitrate (Cr0.12Sn0.82(NO3)2) 210893-18-8, Tin
 zinc nitrate (Sn0.88Zn0.12(NO3)2) 210893-19-9, Tin vanadium nitrate
 (Sn0.82V0.12(NO3)2) 210893-22-4, Lead manganese nitrate
 (Pb0.78Mn0.22(NO3)2) 210893-23-5, Iron lead nitrate (Fe0.12Pb0.88(NO3)2)
 210893-24-6, Cobalt lead nitrate (Co0.18Pb0.82(NO3)2) 210893-25-7,
 Copper lead nitrate (Cu0.18Pb0.82(NO3)2) 210893-26-8, Lead titanium
 nitrate (Pb0.82Ti0.12(NO3)2) 210893-27-9, Lead zinc nitrate
 (Pb0.88Zn0.12(NO3)2) 210893-28-0, Chromium lead nitrate
 (Cr0.12Pb0.82(NO3)2) 210893-29-1, Lead tungsten nitrate
 (Pb0.82W0.09(NO3)2) 210893-30-4, Indium iron nitrate
 (In0.88Fe0.18(NO3)3) 210893-31-5, Cobalt indium nitrate
 (Co0.27In0.82(NO3)3) 210893-32-6, Copper indium nitrate
 (Cu0.27In0.82(NO3)3) 210893-33-7, Bismuth titanium nitrate
 (Bi0.82Ti0.27(NO3)3) 210893-34-8, Bismuth zinc nitrate
 (Bi0.88Zn0.27(NO3)3) 210893-36-0 210893-37-1 210893-38-2
 210893-41-7 210893-44-0 210893-45-1 210893-46-2 210893-47-3
 210893-48-4 210893-50-8 210893-51-9 210893-52-0 210893-54-2
 210893-55-3 210893-56-4 210893-57-5 210893-58-6 210893-59-7
 210893-60-0 210893-61-1 210893-62-2 210893-63-3 210893-64-4,
 Chromium tin carbonate (Cr0.2Sn0.7(CO3)) 210893-65-5, Tin titanium
 carbonate (Sn0.7Ti0.2(CO3)) 210893-66-6 210893-67-7 210893-68-8
 210893-69-9 210893-70-2 210893-71-3 210893-72-4 210893-73-5
 210893-74-6 210893-75-7, Lead titanium carbonate (Pb0.7Ti0.2(CO3))
 210893-76-8 210893-77-9, Chromium lead carbonate (Cr0.2Pb0.7(CO3))
 210893-78-0 210893-79-1, Indium iron carbonate (In1.6Fe0.6(CO3)3)
 210893-80-4, Copper indium carbonate (Cu0.6In1.6(CO3)3) 210893-81-5,
 Cobalt indium carbonate (Co0.6In1.6(CO3)3) 210893-82-6, Bismuth titanium
 carbonate (Bi1.6Ti0.4(CO3)3) 210893-83-7, Indium zinc carbonate
 (In1.6Zn0.6(CO3)3) 210893-84-8, Barium tin carbonate (Ba0.2Sn0.8(HCO3)2)
 210893-85-9, Calcium tin carbonate (Ca0.2Sn0.8(HCO3)2) 210893-86-0,
 Strontium tin carbonate (Sr0.2Sn0.8(HCO3)2) 210893-87-1, Magnesium tin
 carbonate (Mg0.2Sn0.8(HCO3)2) 210893-88-2, Manganese tin carbonate
 (Mn0.2Sn0.8(HCO3)2) 210893-89-3, Iron tin carbonate (Fe0.2Sn0.8(HCO3)2)
 210893-90-6, Cobalt tin carbonate (Co0.2Sn0.8(HCO3)2) 210893-91-7,
 Copper tin carbonate (Cu0.2Sn0.8(HCO3)2) 210893-92-8, Tin titanium
 carbonate (Sn0.7Ti0.2(HCO3)2) 210893-93-9, Tin zinc carbonate
 (Sn0.8Zn0.2(HCO3)2) 210893-94-0, Chromium tin carbonate
 (Cr0.2Sn0.7(HCO3)2) 210893-95-1, Molybdenum tin carbonate
 (Mo0.2Sn0.8(HCO3)2) 210893-96-2, Barium lead carbonate
 (Ba0.2Pb0.8(HCO3)2) 210893-97-3, Calcium lead carbonate
 (Ca0.2Pb0.8(HCO3)2) 210893-98-4, Lead strontium carbonate
 (Pb0.8Sr0.2(HCO3)2) 210893-99-5, Lead magnesium carbonate
 (Pb0.8Mg0.2(HCO3)2) 210894-00-1, Lead manganese carbonate
 (Pb0.8Mn0.2(HCO3)2) 210894-01-2, Iron lead carbonate (Fe0.2Pb0.8(HCO3)2)
 210894-02-3, Cobalt lead carbonate (Co0.2Pb0.8(HCO3)2) 210894-03-4,
 Copper lead carbonate (Cu0.2Pb0.8(HCO3)2) 210894-04-5, Lead titanium
 carbonate (Pb0.7Ti0.2(HCO3)2) 210894-05-6, Lead zinc carbonate
 (Pb0.8Zn0.2(HCO3)2) 210894-06-7, Chromium lead carbonate

(Cr0.2Pb0.7(HCO3)2) 210894-07-8, Lead molybdenum carbonate
 (Pb0.8Mo0.2(HCO3)2) 210894-08-9, Indium iron carbonate
 (In0.8Fe0.3(HCO3)3) 210894-09-0, Cobalt indium carbonate
 (Co0.3In0.8(HCO3)3) 210894-10-3, Copper indium carbonate
 (Cu0.3In0.8(HCO3)3) 210894-11-4, Bismuth titanium carbonate
 (Bi0.8Ti0.2(HCO3)3) 210894-12-5, Bismuth zinc carbonate
 (Bi0.8Zn0.3(HCO3)3) 210894-15-8 210894-16-9 210894-17-0
 210894-18-1 210894-19-2 210894-20-5 210894-21-6 210894-22-7
 210894-23-8 210894-24-9 210894-25-0 210894-26-1 210894-27-2
 210894-29-4 210894-30-7 210894-31-8 210894-32-9 210894-33-0
 210894-34-1 210894-36-3 210894-37-4, Barium tin borate
 (Ba0.1Sn0.9(HBO3)) 210894-38-5, Calcium tin borate (Ca0.1Sn0.9(HBO3))
 210894-39-6, Strontium tin borate (Sr0.1Sn0.9(HBO3)) 210894-40-9,
 Magnesium tin borate (Mg0.1Sn0.9(HBO3)) 210894-41-0, Tin zinc borate
 (Sn0.9Zn0.1(HBO3)) 210894-42-1, Copper tin borate (Cu0.1Sn0.9(HBO3))
 210894-43-2, Cobalt tin borate (Co0.1Sn0.9(HBO3)) 210894-44-3, Iron tin
 borate (Fe0.1Sn0.9(HBO3)) 210894-45-4, Nickel tin borate
 (Ni0.1Sn0.9(HBO3)) 210894-46-5, Tin titanium borate (Sn0.7Ti0.2(HBO3))
 210894-47-6, Chromium tin borate (Cr0.1Sn0.7(HBO3)) 210894-48-7, Tin
 vanadium borate (Sn0.9V0.1(HBO3)) 210894-49-8, Molybdenum tin borate
 (Mo0.1Sn0.9(HBO3)) 210894-50-1, Tin tungsten borate (Sn0.8W0.1(HBO3))
 210894-51-2, Indium manganese borate (In1.6Mn0.6(HBO3)3) 210894-52-3,
 Indium nickel borate (In1.6Ni0.6(HBO3)3) 210894-53-4, Cobalt indium
 borate (Co0.6In1.6(HBO3)3) 210894-54-5, Bismuth manganese borate
 (Bi1.6Mn0.6(HBO3)3) 210894-55-6, Bismuth nickel borate
 (Bi1.6Ni0.6(HBO3)3) 210894-56-7, Bismuth cobalt borate
 (Bi1.6Co0.6(HBO3)3) 210894-57-8, Barium lead borate (Ba0.1Pb0.9(HBO3))
 210894-58-9, Calcium lead borate (Ca0.1Pb0.9(HBO3)) 210894-59-0, Lead
 strontium borate (Pb0.9Sr0.1(HBO3)) 210894-60-3, Lead magnesium borate
 (Pb0.9Mg0.1(HBO3)) 210894-62-5, Lead zinc borate (Pb0.9Zn0.1(HBO3))
 210894-63-6, Copper lead borate (Cu0.1Pb0.9(HBO3)) 210894-64-7, Cobalt
 lead borate (Co0.1Pb0.9(HBO3)) 210894-65-8, Iron lead borate
 (Fe0.1Pb0.9(HBO3)) 210894-66-9, Lead nickel borate (Pb0.9Ni0.1(HBO3))
 210894-67-0, Lead titanium borate (Pb0.7Ti0.2(HBO3)) 210894-68-1,
 Chromium lead borate (Cr0.1Pb0.7(HBO3)) 210894-69-2, Lead vanadium
 borate (Pb0.9V0.1(HBO3)) 210894-70-5, Lead molybdenum borate
 (Pb0.9Mo0.1(HBO3)) 210894-71-6, Lead tungsten borate (Pb0.8W0.1(HBO3))
 210894-72-7 210894-73-8 210894-74-9
 210894-75-0 210894-76-1 210894-77-2 210894-78-3
 210894-79-4 210894-80-7 210894-81-8 210894-82-9 210894-83-0
 210894-84-1 210894-85-2 210894-92-1 210894-96-5 210895-00-4
 210895-01-5 210895-02-6 210895-03-7
 210895-04-8 210895-05-9 210895-06-0
 210895-07-1 210895-08-2 210895-09-3 210895-11-7
 210895-14-0 210895-15-1 210895-16-2 210895-17-3 210895-18-4
 210895-19-5 210895-20-8 210895-21-9 210895-22-0 210895-23-1
 210895-24-2 210895-25-3 210895-26-4 210895-27-5 210895-29-7
 210895-32-2 210895-44-6 210895-45-7 210895-48-0 210895-58-2
 210895-59-3 210895-60-6 210895-61-7 210895-62-8 210895-63-9
 210895-64-0 210895-65-1 210895-66-2 210895-67-3 210895-68-4
 210895-69-5 210895-70-8 210895-71-9 210895-72-0 210895-73-1
 210895-74-2 210895-75-3 210895-76-4 210895-77-5 210895-78-6
 210895-79-7 210895-80-0 210895-81-1 210895-82-2 210895-84-4
 210895-85-5 210895-86-6 210895-87-7 210895-88-8 210895-89-9
 210895-90-2 210895-91-3 210895-92-4 210895-93-5 210895-94-6
 210895-95-7 210895-96-8 210895-97-9 210895-98-0 210895-99-1
 210896-00-7 210896-01-8 210896-02-9 210896-03-0 210896-04-1
 210896-05-2 210896-06-3 210896-07-4 210896-08-5 210896-09-6
 210896-11-0

RL: DEV (Device component use); USES (Uses)
 (anode active material for lithium-ion batteries)

IT 210896-13-2 210896-15-4 210896-17-6 210896-19-8 210896-21-2
210896-24-5 210896-29-0 210896-41-6
210896-44-9 210896-46-1 210896-48-3 210896-50-7
210896-52-9 210896-54-1 210896-56-3 **210896-59-6**
210896-61-0 210896-62-1 210896-63-2 21089
6-65-4 210896-67-6 210896-69-8
210896-74-5 210896-76-7 210896-78-9
210896-80-3 210896-82-5 210896-84-7
210896-86-9 210896-87-0 210896-88-1 210896-89-2
210896-90-5 210896-91-6 210896-92-7 210896-93-8 210896-94-9
210896-95-0 210896-96-1 210896-97-2 210896-98-3 210896-99-4
210897-00-0 210897-01-1 210897-03-3 210897-06-6 210897-08-8
210897-10-2 210897-12-4 210897-15-7 210897-17-9 210897-18-0
210897-19-1 210897-20-4 210897-21-5 210897-22-6 210897-23-7
210897-24-8 210897-26-0 210897-27-1 210897-29-3 210897-31-7
210897-34-0 210897-37-3 210897-39-5 210897-43-1 210897-47-5
210897-51-1 210897-55-5 210897-58-8 210897-61-3 **210897-68-0**
210897-79-3 **210897-87-3** 210897-90-8 210897-94-2
210897-99-7 210898-22-9 **210898-39-8**, Magnesium tin sulfate
(Mg0.1Sn0.9(SO4)) 210898-43-4, Strontium tin sulfate (Sr0.1Sn0.9(SO4))
210898-47-8, Calcium tin sulfate (Ca0.1Sn0.9(SO4)) **210898-50-3**,
Tin zinc sulfate (Sn0.9Zn0.1(SO4)) 210898-52-5, Nickel tin sulfate
(Ni0.1Sn0.9(SO4)) 210898-53-6, Iron tin sulfate (Fe0.1Sn0.9(SO4))
210898-54-7, Cobalt tin sulfate (Co0.1Sn0.9(SO4)) 210898-55-8, Manganese
tin sulfate (Mn0.1Sn0.9(SO4)) **210898-56-9**, Copper tin sulfate
(Cu0.1Sn0.9(SO4)) 210898-57-0, Molybdenum tin sulfate (Mo0.1Sn0.9(SO4))
210898-58-1, Tin vanadium sulfate (Sn0.9V0.1(SO4)) **210898-59-2**,
Tin tungsten sulfate (Sn0.8W0.1(SO4)) 210898-60-5, Chromium tin sulfate
(Cr0.2Sn0.7(SO4)) 210898-62-7, Molybdenum tin sulfate (Mo0.2Sn0.7(SO4))
210898-64-9, Lead magnesium sulfate (Pb0.9Mg0.1(SO4))
210898-68-3, Lead strontium sulfate (Pb0.9Sr0.1(SO4)) 210898-71-8,
Calcium lead sulfate (Ca0.1Pb0.9(SO4)) **210898-75-2**, Lead zinc
sulfate (Pb0.9Zn0.1(SO4)) 210898-77-4, Lead nickel sulfate
(Pb0.9Ni0.1(SO4)) 210898-79-6, Iron lead sulfate (Fe0.1Pb0.9(SO4))
210898-81-0, Cobalt lead sulfate (Co0.1Pb0.9(SO4)) 210898-82-1, Lead
manganese sulfate (Pb0.9Mn0.1(SO4)) **210898-83-2**, Copper lead
sulfate (Cu0.1Pb0.9(SO4)) 210898-84-3, Lead molybdenum sulfate
(Pb0.9Mo0.1(SO4)) 210898-85-4, Lead vanadium sulfate (Pb0.9V0.1(SO4))
210898-86-5, Lead tungsten sulfate (Pb0.8W0.1(SO4)) 210898-87-6,
Chromium lead sulfate (Cr0.2Pb0.7(SO4)) 210898-88-7, Lead molybdenum
sulfate (Pb0.7Mo0.2(SO4)) **210898-89-8**, Magnesium tin sulfate
(Mg0.1Sn0.9(HSO4)2) 210898-90-1, Strontium tin sulfate
(Sr0.1Sn0.9(HSO4)2) 210898-91-2, Calcium tin sulfate (Ca0.1Sn0.9(HSO4)2)
210898-92-3, Tin zinc sulfate (Sn0.9Zn0.1(HSO4)2) 210898-93-4,
Nickel tin sulfate (Ni0.1Sn0.9(HSO4)2) 210898-94-5, Iron tin sulfate
(Fe0.1Sn0.9(HSO4)2) 210898-95-6, Cobalt tin sulfate (Co0.1Sn0.9(HSO4)2)
210898-96-7, Manganese tin sulfate (Mn0.1Sn0.9(HSO4)2) **210898-97-8**
, Copper tin sulfate (Cu0.1Sn0.9(HSO4)2) 210898-98-9, Molybdenum tin
sulfate (Mo0.1Sn0.9(HSO4)2) 210898-99-0, Tin vanadium sulfate
(Sn0.9V0.1(HSO4)2) **210899-00-6**, Tin tungsten sulfate
(Sn0.8W0.1(HSO4)2) 210899-01-7, Chromium tin sulfate (Cr0.2Sn0.7(HSO4)2)
210899-02-8, Molybdenum tin sulfate (Mo0.2Sn0.7(HSO4)2)
210899-03-9, Lead magnesium sulfate (Pb0.9Mg0.1(HSO4)2)
210899-04-0, Lead strontium sulfate (Pb0.9Sr0.1(HSO4)2) 210899-05-1,
Calcium lead sulfate (Ca0.1Pb0.9(HSO4)2) **210899-06-2**, Lead zinc
sulfate (Pb0.9Zn0.1(HSO4)2) 210899-07-3, Lead nickel sulfate
(Pb0.9Ni0.1(HSO4)2) 210899-09-5, Iron lead sulfate (Fe0.1Pb0.9(HSO4)2)
210899-10-8, Cobalt lead sulfate (Co0.1Pb0.9(HSO4)2) 210899-11-9, Lead
manganese sulfate (Pb0.9Mn0.1(HSO4)2) **210899-12-0**, Copper lead
sulfate (Cu0.1Pb0.9(HSO4)2) 210899-13-1, Lead molybdenum sulfate
(Pb0.9Mo0.1(HSO4)2) 210899-14-2, Lead vanadium sulfate

(Pb0.9V0.1(HSO4)2) 210899-16-4, Lead tungsten sulfate
 (Pb0.8W0.1(HSO4)2) 210899-18-6, Chromium lead sulfate
 (Cr0.2Pb0.7(HSO4)2) 210899-20-0, Lead molybdenum sulfate
 (Pb0.7Mo0.2(HSO4)2) 210899-22-2, Indium magnesium sulfate
 (In1.6Mg0.6(SO4)3) 210899-23-3, Indium zinc sulfate
 (In1.6Zn0.6(SO4)3) 210899-24-4, Indium nickel sulfate (In1.6Ni0.6(SO4)3)
 210899-25-5, Bismuth cobalt sulfate (Bi1.6Co0.6(SO4)3) 210899-26-6,
 Bismuth iron sulfate (Bi1.6Fe0.6(SO4)3) 210899-28-8, Bismuth manganese
 sulfate (Bi1.6Mn0.6(SO4)3) 210899-29-9 210899-30-2 210899-31-3
 210899-32-4 210899-33-5, Cobalt indium sulfate (Co0.3In0.8(HSO4)3)
 210899-34-6, Indium iron sulfate (In0.8Fe0.3(HSO4)3) 210899-35-7, Indium
 manganese sulfate (In0.8Mn0.3(HSO4)3) 210899-36-8, Bismuth
 magnesium sulfate (Bi0.8Mg0.3(HSO4)3) 210899-37-9, Bismuth zinc
 sulfate (Bi0.8Zn0.3(HSO4)3) 210899-38-0, Bismuth nickel sulfate
 (Bi0.8Ni0.3(HSO4)3) 210899-41-5, Tin sulfate (Sn(HSO4)0.2(SO4)0.9)
 210899-43-7, Lead sulfate (Pb(HSO4)0.2(SO4)0.9) 210899-45-9, Indium
 sulfate (In2(HSO4)0.2(SO4)2.9) 210899-47-1, Bismuth sulfate
 (Bi2(HSO4)0.2(SO4)2.9) 210899-52-8 210899-53-9 210899-56-2
 210899-74-4 210899-75-5 210899-76-6 210899-77-7 210899-81-3
 210899-87-9 210899-95-9 210899-97-1 210900-00-8 210900-02-0
 210900-03-1 210900-05-3 210900-07-5 210900-08-6 210900-09-7
 210900-10-0 210900-11-1 210900-12-2 210900-14-4 210900-24-6
 210900-29-1 210900-40-6 210900-49-5 210900-55-3 210900-61-1
 210900-68-8 210900-77-9 210900-94-0 210901-01-2 210901-08-9
 210901-16-9 210901-21-6 210901-28-3 210901-33-0 210901-36-3
 210901-39-6 210901-49-8 210901-59-0 210901-64-7 210901-68-1,
 Magnesium tin selenate (Mg0.1Sn0.9(SeO4)) 210901-72-7, Tin zinc selenate
 (Sn0.9Zn0.1(SeO4)) 210901-75-0, Nickel tin selenate (Ni0.1Sn0.9(SeO4))
 210901-78-3, Iron tin selenate (Fe0.1Sn0.9(SeO4)) 210901-82-9, Cobalt
 tin selenate (Co0.1Sn0.9(SeO4)) 210901-85-2, Manganese tin selenate
 (Mn0.1Sn0.9(SeO4)) 210901-88-5, Copper tin selenate (Cu0.1Sn0.9(SeO4))
 210901-90-9, Molybdenum tin selenate (Mo0.1Sn0.9(SeO4)) 210901-92-1, Tin
 vanadium selenate (Sn0.9V0.1(SeO4)) 210901-94-3, Tin tungsten selenate
 (Sn0.8W0.1(SeO4)) 210901-98-7, Chromium tin selenate (Cr0.2Sn0.7(SeO4))
 210902-03-7, Calcium tin selenate (Ca0.1Sn0.9(SeO4)) 210902-05-9,
 Strontium tin selenate (Sr0.1Sn0.9(SeO4)) 210902-06-0, Barium tin
 selenate (Ba0.1Sn0.9(SeO4)) 210902-07-1, Lead magnesium selenate
 (Pb0.9Mg0.1(SeO4)) 210902-08-2, Lead zinc selenate (Pb0.9Zn0.1(SeO4))
 210902-09-3, Lead nickel selenate (Pb0.9Ni0.1(SeO4)) 210902-10-6, Iron
 lead selenate (Fe0.1Pb0.9(SeO4)) 210902-11-7, Cobalt lead selenate
 (Co0.1Pb0.9(SeO4)) 210902-12-8, Lead manganese selenate
 (Pb0.9Mn0.1(SeO4)) 210902-13-9, Copper lead selenate (Cu0.1Pb0.9(SeO4))
 210902-14-0, Lead molybdenum selenate (Pb0.9Mo0.1(SeO4)) 210902-15-1,
 Lead vanadium selenate (Pb0.9V0.1(SeO4)) 210902-16-2, Calcium lead
 selenate (Ca0.1Pb0.9(SeO4)) 210902-17-3, Lead strontium selenate
 (Pb0.9Sr0.1(SeO4)) 210902-18-4, Barium lead selenate (Ba0.1Pb0.9(SeO4))
 210902-19-5, Lead tungsten selenate (Pb0.8W0.1(SeO4)) 210902-20-8,
 Chromium lead selenate (Cr0.2Pb0.7(SeO4)) 210902-21-9, Magnesium tin
 selenate (Mg0.1Sn0.9(HSeO4)) 210902-22-0, Tin zinc selenate
 (Sn0.9Zn0.1(HSeO4)) 210902-23-1, Nickel tin selenate (Ni0.1Sn0.9(HSeO4))
 210902-24-2, Iron tin selenate (Fe0.1Sn0.9(HSeO4)) 210902-25-3, Cobalt
 tin selenate (Co0.1Sn0.9(HSeO4)) 210902-26-4, Manganese tin selenate
 (Mn0.1Sn0.9(HSeO4)) 210902-27-5, Copper tin selenate (Cu0.1Sn0.9(HSeO4))
 210902-28-6, Molybdenum tin selenate (Mo0.1Sn0.9(HSeO4)) 210902-29-7,
 Tin vanadium selenate (Sn0.9V0.1(HSeO4)) 210902-30-0, Calcium tin
 selenate (Ca0.1Sn0.9(HSeO4)) 210902-31-1, Strontium tin selenate
 (Sr0.1Sn0.9(HSeO4)) 210902-32-2, Barium tin selenate (Ba0.1Sn0.9(HSeO4))
 210902-33-3, Tin tungsten selenate (Sn0.8W0.1(HSeO4)) 210902-34-4,
 Chromium tin selenate (Cr0.2Sn0.7(HSeO4)) 210902-35-5, Lead magnesium
 selenate (Pb0.9Mg0.1(HSeO4))
 RL: DEV (Device component use); USES (Uses)

(anode active material for lithium-ion batteries)

IT 210902-36-6, Lead zinc selenate ($\text{Pb}_{0.9}\text{Zn}_{0.1}(\text{HSeO}_4)$) 210902-37-7, Lead nickel selenate ($\text{Pb}_{0.9}\text{Ni}_{0.1}(\text{HSeO}_4)$) 210902-38-8, Iron lead selenate ($\text{Fe}_{0.1}\text{Pb}_{0.9}(\text{HSeO}_4)$) 210902-39-9, Cobalt lead selenate ($\text{Co}_{0.1}\text{Pb}_{0.9}(\text{HSeO}_4)$) 210902-40-2, Lead manganese selenate ($\text{Pb}_{0.9}\text{Mn}_{0.1}(\text{HSeO}_4)$) 210902-41-3, Copper lead selenate ($\text{Cu}_{0.1}\text{Pb}_{0.9}(\text{HSeO}_4)$) 210902-43-5, Lead molybdenum selenate ($\text{Pb}_{0.9}\text{Mo}_{0.1}(\text{HSeO}_4)$) 210902-45-7, Lead vanadium selenate ($\text{Pb}_{0.9}\text{V}_{0.1}(\text{HSeO}_4)$) 210902-47-9, Calcium lead selenate ($\text{Ca}_{0.1}\text{Pb}_{0.9}(\text{HSeO}_4)$) 210902-49-1, Lead strontium selenate ($\text{Pb}_{0.9}\text{Sr}_{0.1}(\text{HSeO}_4)$) 210902-50-4, Barium lead selenate ($\text{Ba}_{0.1}\text{Pb}_{0.9}(\text{HSeO}_4)$) 210902-51-5, Lead tungsten selenate ($\text{Pb}_{0.8}\text{W}_{0.1}(\text{HSeO}_4)$) 210902-52-6, Chromium lead selenate ($\text{Cr}_{0.2}\text{Pb}_{0.7}(\text{HSeO}_4)$) 210902-53-7, Indium magnesium selenate ($\text{In}_{1.6}\text{Mg}_{0.6}(\text{SeO}_4)_3$) 210902-54-8, Indium zinc selenate ($\text{In}_{1.6}\text{Zn}_{0.6}(\text{SeO}_4)_3$) 210902-55-9, Indium nickel selenate ($\text{In}_{1.6}\text{Ni}_{0.6}(\text{SeO}_4)_3$) 210902-56-0, Bismuth cobalt selenate ($\text{Bi}_{1.6}\text{Co}_{0.6}(\text{SeO}_4)_3$) 210902-57-1, Bismuth iron selenate ($\text{Bi}_{1.6}\text{Fe}_{0.6}(\text{SeO}_4)_3$) 210902-58-2, Bismuth manganese selenate ($\text{Bi}_{1.6}\text{Mn}_{0.6}(\text{SeO}_4)_3$) 210902-59-3, Cobalt indium selenate ($\text{Co}_{0.3}\text{In}_{0.8}(\text{HSeO}_4)_3$) 210902-60-6, Indium iron selenate ($\text{In}_{0.8}\text{Fe}_{0.3}(\text{HSeO}_4)_3$) 210902-61-7, Indium manganese selenate ($\text{In}_{0.8}\text{Mn}_{0.3}(\text{HSeO}_4)_3$) 210902-62-8, Bismuth magnesium selenate ($\text{Bi}_{0.8}\text{Mg}_{0.3}(\text{HSeO}_4)_3$) 210902-63-9, Bismuth zinc selenate ($\text{Bi}_{0.8}\text{Zn}_{0.3}(\text{HSeO}_4)_3$) 210902-64-0, Bismuth nickel selenate ($\text{Bi}_{0.8}\text{Ni}_{0.3}(\text{HSeO}_4)_3$) 210902-65-1 210902-66-2 210902-68-4, Lead tellurium oxide (PbTe_{308}) 210902-70-8 210902-72-0 210902-74-2 210902-75-3 210902-77-5 210902-78-6 210902-85-5 210902-86-6 210902-87-7 210902-88-8 210902-92-4 210902-95-7 210902-97-9 210902-98-0 210902-99-1 210903-00-7 210903-01-8 210903-02-9 210903-03-0 210903-04-1 210903-05-2 210903-06-3 210903-07-4 210903-08-5 210903-09-6 210903-10-9 210903-11-0 210903-13-2 210903-15-4 210903-18-7 210903-26-7, Magnesium tin tellurate ($\text{Mg}_{0.1}\text{Sn}_{0.9}(\text{TeO}_4)$) 210903-28-9, Calcium tin tellurate ($\text{Ca}_{0.1}\text{Sn}_{0.9}(\text{TeO}_4)$) 210903-32-5, Strontium tin tellurate ($\text{Sr}_{0.1}\text{Sn}_{0.9}(\text{TeO}_4)$) 210903-36-9, Tin zinc tellurate ($\text{Sn}_{0.9}\text{Zn}_{0.1}(\text{TeO}_4)$) 210903-38-1, Nickel tin tellurate ($\text{Ni}_{0.1}\text{Sn}_{0.9}(\text{TeO}_4)$) 210903-41-6, Iron tin tellurate ($\text{Fe}_{0.1}\text{Sn}_{0.9}(\text{TeO}_4)$) 210903-44-9, Cobalt tin tellurate ($\text{Co}_{0.1}\text{Sn}_{0.9}(\text{TeO}_4)$) 210903-47-2, Manganese tin tellurate ($\text{Mn}_{0.1}\text{Sn}_{0.9}(\text{TeO}_4)$) 210903-50-7, Copper tin tellurate ($\text{Cu}_{0.1}\text{Sn}_{0.9}(\text{TeO}_4)$) 210903-53-0, Molybdenum tin tellurate ($\text{Mo}_{0.1}\text{Sn}_{0.9}(\text{TeO}_4)$) 210903-56-3, Tin vanadium tellurate ($\text{Sn}_{0.9}\text{V}_{0.1}(\text{TeO}_4)$) 210903-59-6, Tin tungsten tellurate ($\text{Sn}_{0.8}\text{W}_{0.1}(\text{TeO}_4)$) 210903-62-1, Chromium tin tellurate ($\text{Cr}_{0.2}\text{Sn}_{0.7}(\text{TeO}_4)$) 210903-65-4, Lead magnesium tellurate ($\text{Pb}_{0.9}\text{Mg}_{0.1}(\text{TeO}_4)$) 210903-68-7, Calcium lead tellurate ($\text{Ca}_{0.1}\text{Pb}_{0.9}(\text{TeO}_4)$) 210903-72-3, Lead strontium tellurate ($\text{Pb}_{0.9}\text{Sr}_{0.1}(\text{TeO}_4)$) 210903-76-7, Lead zinc tellurate ($\text{Pb}_{0.9}\text{Zn}_{0.1}(\text{TeO}_4)$) 210903-80-3, Lead nickel tellurate ($\text{Pb}_{0.9}\text{Ni}_{0.1}(\text{TeO}_4)$) 210903-83-6, Iron lead tellurate ($\text{Fe}_{0.1}\text{Pb}_{0.9}(\text{TeO}_4)$) 210903-86-9, Cobalt lead tellurate ($\text{Co}_{0.1}\text{Pb}_{0.9}(\text{TeO}_4)$) 210903-89-2, Lead manganese tellurate ($\text{Pb}_{0.9}\text{Mn}_{0.1}(\text{TeO}_4)$) 210903-93-8, Copper lead tellurate ($\text{Cu}_{0.1}\text{Pb}_{0.9}(\text{TeO}_4)$) 210903-97-2, Lead molybdenum tellurate ($\text{Pb}_{0.9}\text{Mo}_{0.1}(\text{TeO}_4)$) 210903-98-3, Lead vanadium tellurate ($\text{Pb}_{0.9}\text{V}_{0.1}(\text{TeO}_4)$) 210903-99-4, Lead tungsten tellurate ($\text{Pb}_{0.9}\text{W}_{0.1}(\text{TeO}_4)$) 210904-01-1 210904-02-2 210904-04-4 210904-06-6 210904-09-9 210904-12-4 210904-15-7 210904-19-1 210904-21-5 210904-23-7 210904-25-9 210904-27-1 210904-29-3 210904-31-7 210904-33-9 210904-35-1 210904-37-3 210904-39-5 210904-41-9 210904-43-1 210904-46-4 210904-50-0 210904-53-3 210904-56-6 210904-60-2 210904-62-4 210904-65-7 210904-69-1 210904-72-6 210904-76-0 210904-79-3, Chromium lead tellurate ($\text{Cr}_{0.2}\text{Pb}_{0.7}(\text{TeO}_4)$) 210904-81-7, Indium magnesium tellurate ($\text{In}_{1.6}\text{Mg}_{0.6}(\text{TeO}_6)$) 210904-83-9, Indium zinc tellurate ($\text{In}_{1.6}\text{Zn}_{0.6}(\text{TeO}_6)$)

210904-85-1, Indium iron tellurate ($\text{In}_{1.6}\text{Fe}_{0.6}(\text{TeO}_6)$) 210904-86-2, Bismuth magnesium tellurate ($\text{Bi}_{1.6}\text{Mg}_{0.6}(\text{TeO}_6)$) 210904-87-3, Bismuth zinc tellurate ($\text{Bi}_{1.6}\text{Zn}_{0.6}(\text{TeO}_6)$) 210904-88-4, Bismuth iron tellurate ($\text{Bi}_{1.6}\text{Fe}_{0.6}(\text{TeO}_6)$) 210904-89-5 210904-90-8 210904-92-0 210904-96-4
 210905-01-4 210905-03-6 210905-05-8 210905-07-0 210905-28-5
 210905-34-3 210905-51-4 210905-58-1 210905-78-5 210905-85-4
 210906-06-2 210906-18-6 210906-47-1 210906-54-0 210906-60-8
 210906-67-5 210906-73-3 210906-79-9 210906-86-8 210906-93-7
 210907-00-9 210907-06-5, Tin titanium phosphate ($\text{Sn}_{0.7}\text{Ti}_{0.2}(\text{HPO}_4)$)
 210907-11-2 210907-15-6, Chromium tin phosphate ($\text{Cr}_{0.2}\text{Sn}_{0.7}(\text{HPO}_4)$)
 210907-19-0 210907-23-6, Tin tungsten phosphate ($\text{Sn}_{0.8}\text{W}_{0.1}(\text{HPO}_4)$)
 210907-27-0 210907-31-6 210907-34-9 210907-38-3 210907-41-8
 210907-43-0 210907-46-3 210907-50-9 210907-52-1 210907-54-3
 210907-56-5, Lead titanium phosphate ($\text{Pb}_{0.7}\text{Ti}_{0.2}(\text{HPO}_4)$) 210907-58-7, Chromium lead phosphate ($\text{Cr}_{0.2}\text{Pb}_{0.7}(\text{HPO}_4)$) 210907-60-1, Lead tungsten phosphate ($\text{Pb}_{0.8}\text{W}_{0.1}(\text{HPO}_4)$) 210907-62-3, Tin (diphosphate) phosphate ($\text{Sn}_2(\text{P}_2\text{O}_7)_{0.9}(\text{HPO}_4)_{0.2}$) 210907-64-5, Tin (diphosphate) phosphate ($\text{Sn}_2(\text{P}_2\text{O}_7)_{0.8}(\text{HPO}_4)_{0.4}$) 210907-66-7, Lead (diphosphate) phosphate ($\text{Pb}_2(\text{P}_2\text{O}_7)_{0.9}(\text{HPO}_4)_{0.2}$) 210907-68-9, Lead (diphosphate) phosphate ($\text{Pb}_2(\text{P}_2\text{O}_7)_{0.8}(\text{HPO}_4)_{0.4}$) 210907-70-3, Stannanetetracarbonitrile
 210907-74-7 210907-81-6 210907-86-1 210907-89-4 210907-92-9
 210907-95-2, Vanadium cyanide ($\text{V}(\text{CN})_2$) 210907-98-5 210908-00-2
 210908-03-5 210908-07-9 210908-09-1 210908-11-5 210908-13-7
 210908-15-9 210908-17-1 210908-19-3, Niobium cyanide ($\text{Nb}(\text{CN})_3$)
 210908-21-7 210908-24-0 210908-27-3, Tin zinc cyanide ($\text{SnZn}(\text{CN})_4$)
 210908-29-5 210908-34-2 210908-40-0 210908-43-3, Nickel tin cyanide ($\text{NiSn}(\text{CN})_4$) 210908-47-7 210908-51-3 210908-54-6, Tin titanium cyanide ($\text{SnTi}(\text{CN})_5$) 210908-58-0 210908-61-5, Lead nickel cyanide ($\text{PbNi}(\text{CN})_4$) 210908-64-8 210908-67-1 210908-71-7, Lead zinc cyanide ($\text{PbZn}(\text{CN})_4$) 210908-74-0 210908-76-2 210908-79-5 210908-83-1
 210908-85-3, Lead titanium cyanide ($\text{PbTi}(\text{CN})_5$) 210908-87-5
 210908-88-6, Copper indium cyanide ($\text{CuIn}(\text{CN})_5$) 210908-89-7 210908-90-0
 210908-94-4, Indium magnesium cyanide ($\text{InMg}(\text{CN})_5$) 210908-96-6, Bismuth copper cyanide ($\text{BiCu}(\text{CN})_5$) 210908-98-8 210909-01-6 210909-03-8, Bismuth calcium cyanide ($\text{BiCa}(\text{CN})_5$) 210909-06-1, Bismuth magnesium cyanide ($\text{BiMg}(\text{CN})_5$) 210909-08-3, Tungsten oxide silicate ($\text{W}_2\text{O}_4(\text{SiO}_4)$) 210909-10-7, Cadmium tungsten oxide (CdWO_3) 210909-13-0, Indium tungsten oxide (InW_3O_9) 210909-15-2, Antimony tungsten oxide ($\text{Sb}_2\text{W}_3\text{O}_{12}$) 210909-17-4, Tungsten zinc oxide (WZnO_3) 210909-19-6, Gallium tungsten oxide ($\text{Ga}_2\text{W}_3\text{O}_9$) 210909-20-9, Germanium tungsten oxide (GeW_2O_8) 210909-21-0, Germanium tungsten oxide (GeW_2O_6) 210909-27-6, Molybdenum oxide silicate ($\text{Mo}_2\text{O}_4(\text{SiO}_4)$) 210909-28-7, Germanium molybdenum oxide (GeMoO_4) 210909-29-8, Aluminum titanium oxide (AlTiO_5) 210909-30-1, Titanium oxide silicate ($\text{TiO}_4(\text{SiO}_4)$) 210909-31-2, Gallium titanium oxide (GaTiO_5) 210909-32-3, Germanium titanium oxide (GeTiO_3) 210909-33-4, Magnesium titanium oxide (MgTiO_4) 210909-34-5, Calcium titanium oxide (CaTiO_4) 210909-36-7, Antimony zirconium oxide ($\text{Sb}_2\text{Zr}_3\text{O}_9$) 210909-37-8, Gallium zirconium oxide ($\text{Ga}_2\text{Zr}_3\text{O}_9$) 210909-38-9, Germanium zirconium oxide (GeZrO_3) 210909-40-3, Tin vanadium oxide (SnVO_3) 210909-41-4, Lead vanadium oxide (PbVO_3) 210909-45-8, Germanium vanadium oxide (GeV_2O_6) 210909-50-5, Chromium lead oxide (CrPb_3O_6) 210909-51-6, Bismuth chromium oxide (Bi_2CrO_6) 210909-53-8, Chromium indium oxide (CrIn_2O_6)
 RL: DEV (Device component use); USES (Uses)

(anode active material for lithium-ion batteries)

IT 210909-54-9, Antimony chromium oxide ($\text{Sb}_2\text{Cr}_3\text{O}_{12}$) 210909-56-1, Chromium gallium oxide ($\text{Cr}_2\text{Ga}_3\text{O}_8$) 210909-58-3, Chromium germanium oxide (CrGeO_4) 210909-59-4, Chromium magnesium oxide (Cr_2MgO_7) 210909-62-9, Calcium chromium oxide (CaCr_2O_7) 210909-65-2, Chromium strontium oxide (Cr_2SrO_7) 210909-75-4, Germanium niobium oxide (GeNb_2O_6) 210909-76-5, Tantalum oxide silicate ($\text{Ta}_2\text{O}(\text{SiO}_3)_2$) 210909-77-6, Germanium tantalum oxide

(Ge₂Ta₂O₇) 210909-78-7, Aluminum manganese oxide (Al₂MnO₆)
 210909-80-1, Bismuth manganese oxide (Bi₂MnO₆) 210909-81-2, Indium
 manganese oxide (In₂MnO₆)
 RL: DEV (Device component use); USES (Uses)
 (anode active material for lithium-ion batteries)

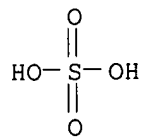
IT 130811-82-4P, Cobalt lithium manganese oxide (Co_{0.2}LiMn_{1.8}O₄)
 RL: DEV (Device component use); PNU (Preparation, unclassified); PREP
 (Preparation); USES (Uses)
 (battery cathodes)

IT 12737-86-9, Tungstate
 RL: DEV (Device component use); USES (Uses)
 (metal and semimetal; anode active material for lithium-ion
 batteries)

IT 7487-88-9, Magnesium sulfate, uses 7733-02-0, Zinc
 sulfate 7757-88-2, Magnesium sulfite 7758-98-7, Copper
 sulfate, uses 7779-86-4 10028-26-9 10043-01-3
 , Aluminum sulfate Al₂(SO₄)₃ 10124-53-5 13597-44-9,
 Zinc sulfite 13773-83-6 13774-25-9 13819-17-5
 13845-15-3 14013-02-6, Copper sulfite CuSO₃
 14590-34-2 15457-98-4 15593-64-3
 15593-67-6 18808-44-1 24738-38-3
 40549-31-3, Aluminum sulfite Al₂(SO₃)₃ 44120-46-9
 44122-15-8 51379-94-3 52435-34-4
 52435-47-9 60994-15-2 71070-32-1
 71843-93-1 91648-98-5 100434-82-0
 100737-52-8 101059-22-7 121814-63-9
 163119-07-1 210894-72-7 210894-73-8
 210894-74-9 210894-75-0 210894-76-1
 210895-00-4 210895-01-5 210895-02-6
 210895-03-7 210895-04-8 210895-05-9
 210895-06-0 210895-07-1 210895-08-2
 210896-24-5 210896-29-0 210896-41-6
 210896-44-9 210896-59-6 210896-61-0
 210896-62-1 210896-63-2 210896-65-4
 210896-67-6 210896-69-8 210896-74-5
 210896-76-7 210896-78-9 210896-80-3
 210896-82-5 210896-84-7 210896-86-9
 210897-68-0 210897-87-3 210898-39-8, Magnesium
 tin sulfate (Mg_{0.1}Sn_{0.9}(SO₄)) 210898-50-3, Tin zinc sulfate
 (Sn_{0.9}Zn_{0.1}(SO₄)) 210898-56-9, Copper tin sulfate
 (Cu_{0.1}Sn_{0.9}(SO₄)) 210898-59-2, Tin tungsten sulfate
 (Sn_{0.8}W_{0.1}(SO₄)) 210898-64-9, Lead magnesium sulfate
 (Pb_{0.9}Mg_{0.1}(SO₄)) 210898-75-2, Lead zinc sulfate
 (Pb_{0.9}Zn_{0.1}(SO₄)) 210898-83-2, Copper lead sulfate
 (Cu_{0.1}Pb_{0.9}(SO₄)) 210898-86-5, Lead tungsten sulfate
 (Pb_{0.8}W_{0.1}(SO₄)) 210898-89-8, Magnesium tin sulfate
 (Mg_{0.1}Sn_{0.9}(HSO₄)₂) 210898-92-3, Tin zinc sulfate
 (Sn_{0.9}Zn_{0.1}(HSO₄)₂) 210898-97-8, Copper tin sulfate
 (Cu_{0.1}Sn_{0.9}(HSO₄)₂) 210899-00-6, Tin tungsten sulfate
 (Sn_{0.8}W_{0.1}(HSO₄)₂) 210899-03-9, Lead magnesium sulfate
 (Pb_{0.9}Mg_{0.1}(HSO₄)₂) 210899-06-2, Lead zinc sulfate
 (Pb_{0.9}Zn_{0.1}(HSO₄)₂) 210899-12-0, Copper lead sulfate
 (Cu_{0.1}Pb_{0.9}(HSO₄)₂) 210899-16-4, Lead tungsten sulfate
 (Pb_{0.8}W_{0.1}(HSO₄)₂) 210899-22-2, Indium magnesium sulfate
 (In_{1.6}Mg_{0.6}(SO₄)₃) 210899-23-3, Indium zinc sulfate
 (In_{1.6}Zn_{0.6}(SO₄)₃) 210899-36-8, Bismuth magnesium sulfate
 (Bi_{0.8}Mg_{0.3}(HSO₄)₃) 210899-37-9, Bismuth zinc sulfate
 (Bi_{0.8}Zn_{0.3}(HSO₄)₃)
 RL: DEV (Device component use); USES (Uses)
 (anode active material for lithium-ion batteries)

RN 7487-88-9 HCAPLUS

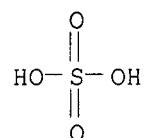
CN Sulfuric acid magnesium salt (1:1) (8CI, 9CI) (CA INDEX NAME)



Mg

RN 7733-02-0 HCAPLUS

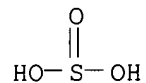
CN Sulfuric acid, zinc salt (1:1) (8CI, 9CI) (CA INDEX NAME)



Zn

RN 7757-88-2 HCAPLUS

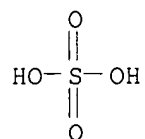
CN Sulfurous acid, magnesium salt (1:1) (8CI, 9CI) (CA INDEX NAME)



Mg

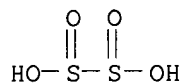
RN 7758-98-7 HCAPLUS

CN Sulfuric acid copper(2+) salt (1:1) (8CI, 9CI) (CA INDEX NAME)



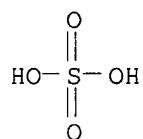
Cu(II)

RN 7779-86-4 HCAPLUS
CN Dithionous acid, zinc salt (1:1) (8CI, 9CI) (CA INDEX NAME)



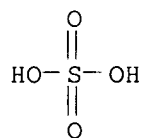
● Zn

RN 10028-26-9 HCAPLUS
CN Sulfuric acid, magnesium salt (2:1) (9CI) (CA INDEX NAME)



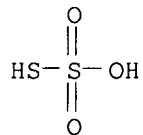
1/2 Mg

RN 10043-01-3 HCAPLUS
CN Sulfuric acid, aluminum salt (3:2) (8CI, 9CI) (CA INDEX NAME)



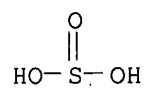
2/3 Al

RN 10124-53-5 HCAPLUS
CN Thiosulfuric acid (H₂S₂O₃), magnesium salt (1:1) (8CI, 9CI) (CA INDEX NAME)



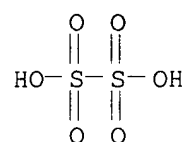
Mg

RN 13597-44-9 HCAPLUS
CN Sulfurous acid, zinc salt (1:1) (8CI, 9CI) (CA INDEX NAME)



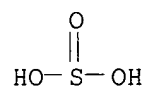
Zn

RN 13773-83-6 HCAPLUS
CN Dithionic acid, zinc salt (1:1) (8CI, 9CI) (CA INDEX NAME)



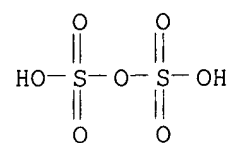
● Zn

RN 13774-25-9 HCAPLUS
CN Sulfurous acid, magnesium salt (2:1) (8CI, 9CI) (CA INDEX NAME)



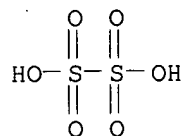
1/2 Mg

RN 13819-17-5 HCAPLUS
CN Disulfuric acid, zinc salt (1:1) (9CI) (CA INDEX NAME)



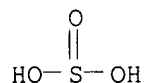
Zn

RN 13845-15-3 HCAPLUS
CN Dithionic acid, magnesium salt (1:1) (8CI, 9CI) (CA INDEX NAME)



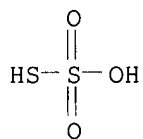
● Mg

RN 14013-02-6 HCAPLUS
CN Sulfurous acid, copper(2+) salt (1:1) (8CI, 9CI) (CA INDEX NAME)



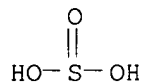
Cu(II)

RN 14590-34-2 HCAPLUS
CN Thiosulfuric acid (H₂S₂O₃), zinc salt (1:1) (9CI) (CA INDEX NAME)



● Zn .

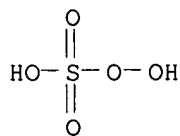
RN 15457-98-4 HCAPLUS
CN Sulfurous acid, zinc salt (2:1) (8CI, 9CI) (CA INDEX NAME)



1/2 · Zn

RN 15593-64-3 HCAPLUS

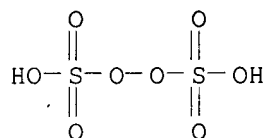
CN Peroxymonosulfuric acid, magnesium salt (1:1) (9CI) (CA INDEX NAME)



● Mg

RN 15593-67-6 HCAPLUS

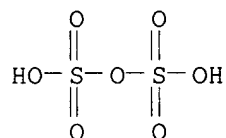
CN Peroxydisulfuric acid ([(HO)S(O)₂]₂O₂), magnesium salt (1:1) (9CI) (CA INDEX NAME)



● Mg

RN 18808-44-1 HCAPLUS

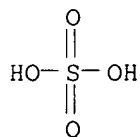
CN Disulfuric acid, magnesium salt (1:1) (9CI) (CA INDEX NAME)



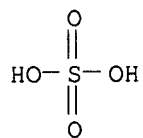
● Mg

RN 24738-38-3 HCAPLUS

CN Sulfuric acid, aluminum salt (3:1) (9CI) (CA INDEX NAME)

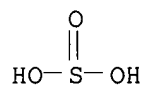


1/3 Al



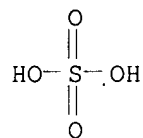
1/3 Al

RN 40549-31-3 HCAPLUS
CN Sulfurous acid, aluminum salt (3:2) (9CI) (CA INDEX NAME)



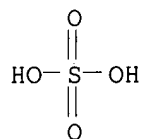
2/3 Al

RN 44120-46-9 HCAPLUS
CN Sulfuric acid, copper(2+) salt (2:1) (9CI) (CA INDEX NAME)



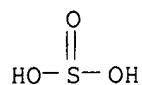
1/2 Cu(II)

RN 44122-15-8 HCAPLUS
CN Sulfuric acid, zinc salt (2:1) (9CI) (CA INDEX NAME)



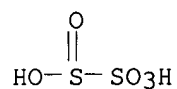
1/2 Zn

RN 51379-94-3 HCAPLUS
CN Sulfurous acid, aluminum salt (3:1) (9CI) (CA INDEX NAME)



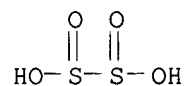
1/3 Al

RN 52435-34-4 HCAPLUS
CN Disulfurous acid, magnesium salt (1:1) (9CI) (CA INDEX NAME)



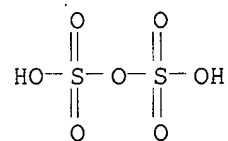
● Mg

RN 52435-47-9 HCAPLUS
CN Dithionous acid, magnesium salt (1:1) (9CI) (CA INDEX NAME)



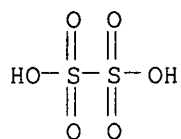
● Mg

RN 60994-15-2 HCAPLUS
CN Disulfuric acid, aluminum salt (3:2) (9CI) (CA INDEX NAME)



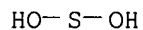
● 2/3 Al

RN 71070-32-1 HCAPLUS
CN Dithionic acid, aluminum salt (3:2) (9CI) (CA INDEX NAME)



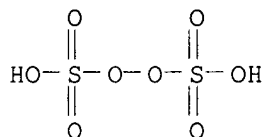
2/3 Al

RN 71843-93-1 HCAPLUS
CN Sulfoxylic acid, zinc salt (1:1) (9CI) (CA INDEX NAME)



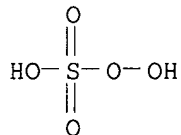
Zn

RN 91648-98-5 HCAPLUS
CN Peroxydisulfuric acid ([(HO)S(O)2]2O2), aluminum salt (3:2) (9CI) (CA INDEX NAME)



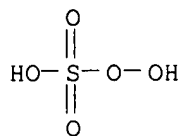
● 2/3 Al

RN 100434-82-0 HCAPLUS
CN Peroxymonosulfuric acid, zinc salt (2:1) (9CI) (CA INDEX NAME)



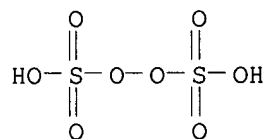
1/2 Zn

RN 100737-52-8 HCAPLUS
CN Peroxymonosulfuric acid, magnesium salt (2:1) (9CI) (CA INDEX NAME)



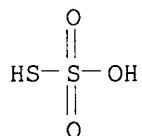
1/2 Mg

RN 101059-22-7 HCAPLUS
CN Peroxydisulfuric acid ([(HO)S(O)2]2O2), zinc salt (1:1) (9CI) (CA INDEX NAME)



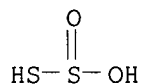
● Zn

RN 121814-63-9 HCAPLUS
CN Thiosulfuric acid (H2S2O3), aluminum salt (3:2) (9CI) (CA INDEX NAME)



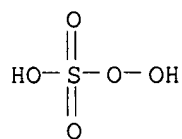
2/3 Al

RN 163119-07-1 HCAPLUS
CN Thiosulfurous acid (H2S2O2), zinc salt (1:1) (9CI) (CA INDEX NAME)



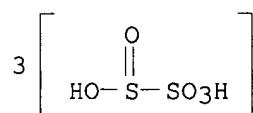
Zn

RN 210894-72-7 HCAPLUS
CN Peroxymonosulfuric acid, aluminum salt (3:2) (9CI) (CA INDEX NAME)



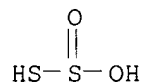
2/3 Al

RN 210894-73-8 HCAPLUS
CN Disulfurous acid, aluminum salt (3:2) (9CI) (CA INDEX NAME)



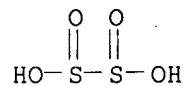
● 2 Al

RN 210894-74-9 HCAPLUS
CN Thiosulfurous acid (H₂S₂O₂), aluminum salt (3:2) (9CI) (CA INDEX NAME)



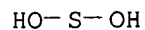
2/3 Al

RN 210894-75-0 HCAPLUS
CN Dithionous acid, aluminum salt (3:2) (9CI) (CA INDEX NAME)



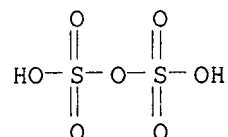
2/3 Al

RN 210894-76-1 HCAPLUS
CN Sulfoxylic acid, aluminum salt (3:2) (9CI) (CA INDEX NAME)



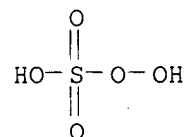
2/3 Al

RN 210895-00-4 HCAPLUS
CN Disulfuric acid, aluminum salt (3:1) (9CI) (CA INDEX NAME)



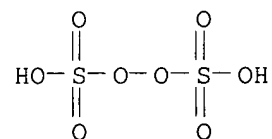
1/3 Al

RN 210895-01-5 HCAPLUS
CN Peroxymonosulfuric acid, aluminum salt (3:1) (9CI) (CA INDEX NAME)



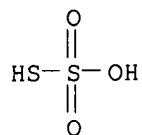
1/3 Al

RN 210895-02-6 HCAPLUS
CN Peroxydisulfuric acid ([(HO)S(O)2]2O2), aluminum salt (3:1) (9CI) (CA INDEX NAME)



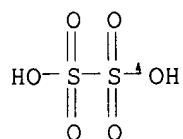
● 1/3 Al

RN 210895-03-7 HCAPLUS
CN Thiosulfuric acid (H2S2O3), aluminum salt (3:1) (9CI) (CA INDEX NAME)



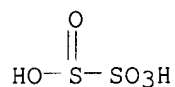
1/3 Al

RN 210895-04-8 HCAPLUS
CN Dithionic acid, aluminum salt (3:1) (9CI) (CA INDEX NAME)



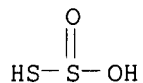
1/3 Al

RN 210895-05-9 HCAPLUS
CN Disulfurous acid, aluminum salt (3:1) (9CI) (CA INDEX NAME)



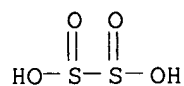
1/3 Al

RN 210895-06-0 HCAPLUS
CN Thiosulfurous acid (H₂S₂O₂), aluminum salt (3:1) (9CI) (CA INDEX NAME)



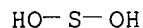
1/3 Al

RN 210895-07-1 HCAPLUS
CN Dithionous acid, aluminum salt (3:1) (9CI) (CA INDEX NAME)



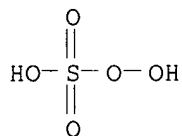
1/3 Al

RN 210895-08-2 HCAPLUS
CN Sulfoxylic acid, aluminum salt (3:1) (9CI) (CA INDEX NAME)



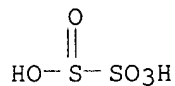
1/3 Al

RN 210896-24-5 HCAPLUS
CN Peroxymonosulfuric acid, zinc salt (1:1) (9CI) (CA INDEX NAME)



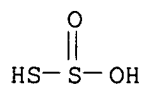
● Zn

RN 210896-29-0 HCAPLUS
CN Disulfurous acid, zinc salt (1:1) (9CI) (CA INDEX NAME)



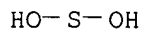
● Zn

RN 210896-41-6 HCAPLUS
CN Thiosulfurous acid (H₂S₂O₂), magnesium salt (1:1) (9CI) (CA INDEX NAME)



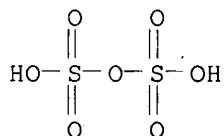
Mg

RN 210896-44-9 HCAPLUS
CN Sulfoxylic acid, magnesium salt (1:1) (9CI) (CA INDEX NAME)



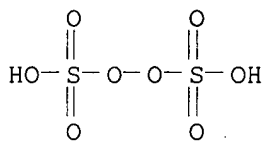
Mg

RN 210896-59-6 HCAPLUS
CN Disulfuric acid, zinc salt (2:1) (9CI) (CA INDEX NAME)



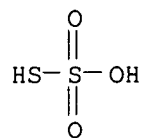
● 1/2 Zn

RN 210896-61-0 HCAPLUS
CN Peroxydisulfuric acid ([(HO)S(O)2]2O2), zinc salt (2:1) (9CI) (CA INDEX NAME)



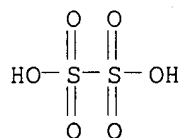
● 1/2 Zn

RN 210896-62-1 HCAPLUS
CN Thiosulfuric acid (H2S2O3), zinc salt (2:1) (9CI) (CA INDEX NAME)



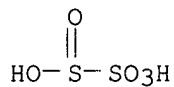
1/2 Zn

RN 210896-63-2 HCAPLUS
CN Dithionic acid, zinc salt (2:1) (9CI) (CA INDEX NAME)



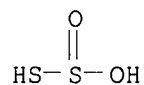
1/2 Zn

RN 210896-65-4 HCAPLUS
CN Disulfurous acid, zinc salt (2:1) (9CI) (CA INDEX NAME)



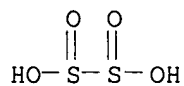
1/2 Zn

RN 210896-67-6 HCAPLUS
CN Thiosulfurous acid (H₂S₂O₂), zinc salt (2:1) (9CI) (CA INDEX NAME)



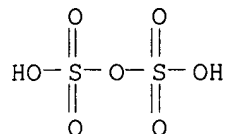
1/2 Zn

RN 210896-69-8 HCAPLUS
CN Dithionous acid, zinc salt (2:1) (9CI) (CA INDEX NAME)



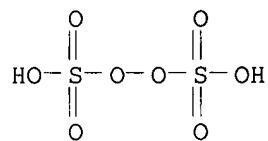
1/2 Zn

RN 210896-74-5 HCAPLUS
CN Disulfuric acid, magnesium salt (2:1) (9CI) (CA INDEX NAME)



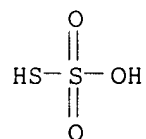
● 1/2 Mg

RN 210896-76-7 HCAPLUS
CN Peroxydisulfuric acid ([(HO)S(O)2]2O2), magnesium salt (2:1) (9CI) (CA INDEX NAME)



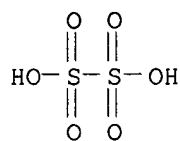
● 1/2 Mg

RN 210896-78-9 HCAPLUS
CN Thiosulfuric acid (H2S2O3), magnesium salt (2:1) (9CI) (CA INDEX NAME)



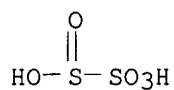
1/2 Mg

RN 210896-80-3 HCAPLUS
CN Dithionic acid, magnesium salt (2:1) (9CI) (CA INDEX NAME)



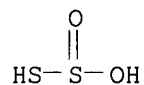
1/2 Mg

RN 210896-82-5 HCAPLUS
CN Disulfurous acid, magnesium salt (2:1) (9CI) (CA INDEX NAME)



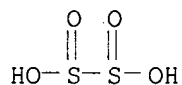
1/2 Mg

RN 210896-84-7 HCAPLUS
CN Thiosulfurous acid (H₂S₂O₂), magnesium salt (2:1) (9CI) (CA INDEX NAME)



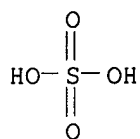
1/2 Mg

RN 210896-86-9 HCAPLUS
CN Dithionous acid, magnesium salt (2:1) (9CI) (CA INDEX NAME)



1/2 Mg

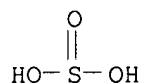
RN 210897-68-0 HCAPLUS
CN Sulfuric acid, tungsten(4+) salt (4:1) (9CI) (CA INDEX NAME)



1/4 W(IV)

RN 210897-87-3 HCAPLUS

CN Sulfurous acid, copper(2+) salt (2:1) (9CI) (CA INDEX NAME)



1/2 Cu(II)

RN 210898-39-8 HCAPLUS

CN Magnesium tin sulfate (Mg0.1Sn0.9(SO4)) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4S	1	14808-79-8
Sn	0.9	7440-31-5
Mg	0.1	7439-95-4

RN 210898-50-3 HCAPLUS

CN Tin zinc sulfate (Sn0.9Zn0.1(SO4)) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4S	1	14808-79-8
Zn	0.1	7440-66-6
Sn	0.9	7440-31-5

RN 210898-56-9 HCAPLUS

CN Copper tin sulfate (Cu0.1Sn0.9(SO4)) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4S	1	14808-79-8
Cu	0.1	7440-50-8
Sn	0.9	7440-31-5

RN 210898-59-2 HCAPLUS

CN Tin tungsten sulfate (Sn0.8W0.1(SO4)) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
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Component	Ratio	Component
Registry Number		
O4S	1	14808-79-8
W	0.1	7440-33-7
Sn	0.8	7440-31-5

RN 210898-64-9 HCAPLUS

CN Lead magnesium sulfate (Pb0.9Mg0.1(SO4)) (9CI) (CA INDEX NAME)

Component	Ratio	Component
Registry Number		
O4S	1	14808-79-8
Mg	0.1	7439-95-4
Pb	0.9	7439-92-1

RN 210898-75-2 HCAPLUS

CN Lead zinc sulfate (Pb0.9Zn0.1(SO4)) (9CI) (CA INDEX NAME)

Component	Ratio	Component
Registry Number		
O4S	1	14808-79-8
Zn	0.1	7440-66-6
Pb	0.9	7439-92-1

RN 210898-83-2 HCAPLUS

CN Copper lead sulfate (Cu0.1Pb0.9(SO4)) (9CI) (CA INDEX NAME)

Component	Ratio	Component
Registry Number		
O4S	1	14808-79-8
Cu	0.1	7440-50-8
Pb	0.9	7439-92-1

RN 210898-86-5 HCAPLUS

CN Lead tungsten sulfate (Pb0.8W0.1(SO4)) (9CI) (CA INDEX NAME)

Component	Ratio	Component
Registry Number		
O4S	1	14808-79-8
W	0.1	7440-33-7
Pb	0.8	7439-92-1

RN 210898-89-8 HCAPLUS

CN Magnesium tin sulfate (Mg0.1Sn0.9(HSO4)2) (9CI) (CA INDEX NAME)

Component	Ratio	Component
Registry Number		
HO4S	2	14996-02-2
Sn	0.9	7440-31-5
Mg	0.1	7439-95-4

RN 210898-92-3 HCAPLUS

CN Tin zinc sulfate (Sn0.9Zn0.1(HSO4)2) (9CI) (CA INDEX NAME)

Component	Ratio	Component
Registry Number		

HO4S		2		14996-02-2
Zn		0.1		7440-66-6
Sn		0.9		7440-31-5

RN 210898-97-8 HCAPLUS

CN Copper tin sulfate (Cu0.1Sn0.9(HSO4)2) (9CI) (CA INDEX NAME)

Component		Ratio		Component Registry Number
=====	+	=====	+	=====
HO4S		2		14996-02-2
Cu		0.1		7440-50-8
Sn		0.9		7440-31-5

RN 210899-00-6 HCAPLUS

CN Tin tungsten sulfate (Sn0.8W0.1(HSO4)2) (9CI) (CA INDEX NAME)

Component		Ratio		Component Registry Number
=====	+	=====	+	=====
HO4S		2		14996-02-2
W		0.1		7440-33-7
Sn		0.8		7440-31-5

RN 210899-03-9 HCAPLUS

CN Lead magnesium sulfate (Pb0.9Mg0.1(HSO4)2) (9CI) (CA INDEX NAME)

Component		Ratio		Component Registry Number
=====	+	=====	+	=====
HO4S		2		14996-02-2
Mg		0.1		7439-95-4
Pb		0.9		7439-92-1

RN 210899-06-2 HCAPLUS

CN Lead zinc sulfate (Pb0.9Zn0.1(HSO4)2) (9CI) (CA INDEX NAME)

Component		Ratio		Component Registry Number
=====	+	=====	+	=====
HO4S		2		14996-02-2
Zn		0.1		7440-66-6
Pb		0.9		7439-92-1

RN 210899-12-0 HCAPLUS

CN Copper lead sulfate (Cu0.1Pb0.9(HSO4)2) (9CI) (CA INDEX NAME)

Component		Ratio		Component Registry Number
=====	+	=====	+	=====
HO4S		2		14996-02-2
Cu		0.1		7440-50-8
Pb		0.9		7439-92-1

RN 210899-16-4 HCAPLUS

CN Lead tungsten sulfate (Pb0.8W0.1(HSO4)2) (9CI) (CA INDEX NAME)

Component		Ratio		Component Registry Number
=====	+	=====	+	=====
HO4S		2		14996-02-2

W		0.1		7440-33-7
Pb		0.8		7439-92-1

RN 210899-22-2 HCAPLUS
 CN Indium magnesium sulfate (In1.6Mg0.6(SO4)3) (9CI) (CA INDEX NAME)

Component		Ratio		Component Registry Number
O4S		3		14808-79-8
In		1.6		7440-74-6
Mg		0.6		7439-95-4

RN 210899-23-3 HCAPLUS
 CN Indium zinc sulfate (In1.6Zn0.6(SO4)3) (9CI) (CA INDEX NAME)

Component		Ratio		Component Registry Number
O4S		3		14808-79-8
In		1.6		7440-74-6
Zn		0.6		7440-66-6

RN 210899-36-8 HCAPLUS
 CN Bismuth magnesium sulfate (Bi0.8Mg0.3(HSO4)3) (9CI) (CA INDEX NAME)

Component		Ratio		Component Registry Number
HO4S		3		14996-02-2
Bi		0.8		7440-69-9
Mg		0.3		7439-95-4

RN 210899-37-9 HCAPLUS
 CN Bismuth zinc sulfate (Bi0.8Zn0.3(HSO4)3) (9CI) (CA INDEX NAME)

Component		Ratio		Component Registry Number
HO4S		3		14996-02-2
Bi		0.8		7440-69-9
Zn		0.3		7440-66-6

L21 ANSWER 27 OF 42 HCAPLUS COPYRIGHT 2001 ACS

AN 1997:796109 HCAPLUS

DN 128:63956

TI Secondary **nonaqueous** electrolyte batteries with carbonaceous anodes

IN Inoue, Tomohiro; Osawa, Toshitaka

PA Ricoh Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01M004-58

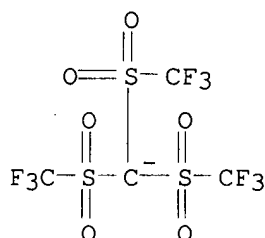
ICS H01M004-02; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI JP 09320599 A2 19971212 JP 1996-158983 19960530
 AB The batteries use Li intercalating anodes composed of a carbonaceous material contg. Be, B, Al, and/or Si. The anodes may contain .gtoreq.2 carbonaceous material with .gtoreq.1 of the materials contg. the above elements. The carbonaceous material is preferably sintered coke having av. particle diam. 3-20 .mu.m, and the electrolyte contains CF3SO3Li, (CF3SO2)2NLi, or (CF3SO2)3CLi.
 ST lithium **battery** carbonaceous **anode** compn; coke **anode** compn. lithium **battery**; beryllium carbonaceous **anode** lithium **battery**; boron carbonaceous **anode** lithium **battery**; aluminum carbonaceous **anode** lithium **battery**; silicon carbonaceous **anode** lithium **battery**
 IT Battery anodes
 (additives for carbonaceous anodes for secondary lithium batteries)
 IT 7440-42-8, Boron, uses 7631-86-9, Silica, uses 13327-32-7, Beryllium hydroxide 21645-51-2, Aluminum hydroxide, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (additives for carbonaceous anodes for secondary lithium batteries)
 IT 7782-42-5, Graphite, uses
 RL: DEV (Device component use); USES (Uses)
 (additives for graphite contg. carbonaceous anodes for secondary lithium batteries)
 IT 33454-82-9, Lithium trifluoromethanesulfonate 90076-65-6
132404-42-3
 RL: DEV (Device component use); USES (Uses)
 (electrolytes for secondary lithium batteries with additive contg. carbonaceous anodes)
 IT **132404-42-3**
 RL: DEV (Device component use); USES (Uses)
 (electrolytes for secondary lithium batteries with additive contg. carbonaceous anodes)
 RN 132404-42-3 HCAPLUS
 CN Methane, tris[(trifluoromethyl)sulfonyl]-, ion(1-), lithium (9CI) (CA INDEX NAME)



● Li⁺

L21 ANSWER 28 OF 42 HCAPLUS COPYRIGHT 2001 ACS
 AN 1997:433205 HCAPLUS
 DN 127:97546
 TI **Nonaqueous** electrolyte batteries with good storage stability
 IN Yanai, Atsushi; Kusumoto, Yasuyuki; Yamazaki, Mikiya; Noma, Toshiyuki; Nishio, Koji
 PA Sanyo Electric Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

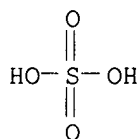
IC ICM H01M004-06

ICS H01M004-08; H01M004-50; H01M006-16

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09147840	A2	19970606	JP 1995-329509	19951124
AB	Anodes of the batteries are obtained by addn. of ammonium sulfates to Mn oxide-based anode materials and subsequent heat treatment of the mixts. Preferably, 0.1-30 mol% (per Mn) ammonium sulfates are added. Preferably, ammonium sulfates of Fe ²⁺ , Co ²⁺ , or Al are used. The ammonium sulfates react with the Mn oxides in the anode materials to form composite oxides, which protect surface of the Mn oxides and prevent reaction of the Mn oxides with nonaq. electrolyte solns. As a result, self-discharge is decreased and storage stability is improved.				
ST	manganese oxide anode nonaq electrolyte battery ; ammonium sulfate treatment manganese oxide anode ; storage stability nonaq electrolyte battery anode				
IT	Battery anodes (nonaq. electrolyte batteries having anodes contg. Mn oxides surface-treated with ammonium sulfates for good storage stability)				
IT	1313-13-9, Manganese oxide (MnO ₂), uses 7783-20-2, Ammonium sulfate, uses 7783-83-7 7784-25-0 , Aluminum ammonium sulfate (AlNH ₄ (SO ₄) ₂) 13586-38-4 15699-18-0 31512-54-6 39457-42-6, Lithium manganese oxide RL: DEV (Device component use); PRP (Properties); USES (Uses) (nonaq. electrolyte batteries having anodes contg. Mn oxides surface-treated with ammonium sulfates for good storage stability)				
IT	7784-25-0 , Aluminum ammonium sulfate (AlNH ₄ (SO ₄) ₂) RL: DEV (Device component use); PRP (Properties); USES (Uses) (nonaq. electrolyte batteries having anodes contg. Mn oxides surface-treated with ammonium sulfates for good storage stability)				
RN	7784-25-0 HCAPLUS				
CN	Sulfuric acid, aluminum ammonium salt (2:1:1) (8CI, 9CI) (CA INDEX NAME)				



1/2 Al

1/2 NH₃

L21 ANSWER 29 OF 42 HCAPLUS COPYRIGHT 2001 ACS

AN 1996:128280 HCAPLUS

DN 124:181125
 TI Secondary batteries containing **nonaqueous**-solvent electrolytes
 IN Hayashi, Katsuya; Tobishima, Shinichi; Arai, So; Yamaki, Junichi
 PA Nippon Telegraph & Telephone, Japan
 SO Jpn. Kokai Tokkyo Koho, 6 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM H01M010-40
 ICS H01M004-02; H01M004-58
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 07302618	A2	19951114	JP 1994-117465	19940509
AB	The batteries comprise Li-intercalating cathodes having charging final voltage .gtoreq.3.5 V and nonaq. solvents contg. ethylene carbonate and solvents having viscosity lower than the ethylene carbonate. The batteries may comprise Li or its alloys as anodes. The cathodes may comprise $\text{Li}_x\text{Mn}_{2-y}\text{MyO}_4$ ($\text{M} = \text{Na, Mg, Sc, Y, Fe, Co, Ni, Cu, Zn, Al, Pb, Sb, Mn}$) .ltoreq. x .ltoreq. 1.2, $0 < y$.ltoreq. 0.7) or mixed oxides contg. Mn_2O_4 . The cathodes may comprise Li_xCoO_2 (0 .ltoreq. x .ltoreq. 1.2), Li_xNiO_2 (0 .ltoreq. x .ltoreq. 1.2), mixed sulfates $\text{Fe}_2(\text{SO}_4)_3$, $\text{Li}_x\text{Mn}_{2-y}\text{Co}_y\text{O}_4$ (0 .ltoreq. x .ltoreq. 1.2, $0 < y$.ltoreq. 0.7). The solvents may comprise 1,2-dimethoxyethane, 1,2-diethoxyethane, 1-ethoxy-2-methoxyethane, di-Me carbonate, di-Et carbonate, and/or Et Me carbonate. The electrolytes may be LiPF_6 , LiAsF_6 , or LiClO_4 . The batteries have high energy d. and long life.				
ST	nonaq electrolyte battery cathode ; ethylene carbonate mixed solvent battery				
IT	Battery electrolytes (batteries contg. mixed nonaq. solvents contg. ethylene carbonate for energy d. and long life)				
IT	7439-93-2, Lithium, uses 7440-44-0, Carbon, uses RL: DEV (Device component use); USES (Uses) (anode ; batteries contg. mixed nonaq. solvents contg. ethylene carbonate for energy d. and long life)				
IT	10028-22-5, Ferric sulfate 12031-65-1, Lithium nickel oxide (LiNiO_2) 12057-17-9, Lithium manganese oxide (LiMn_2O_4) 12190-79-3 146956-26-5, Cobalt lithium manganese oxide ($\text{Co}_0.1\text{LiMn}_{1.9}\text{O}_4$) 174015-34-0 , Iron lithium sulfate ($\text{Fe}_2\text{Li}(\text{SO}_4)_3$) 174180-05-3, Cobalt lithium oxide ($\text{CoLiO}_{1-1.2}\text{O}_2$) 174180-06-4, Lithium nickel oxide ($\text{LiO}_{1-1.2}\text{NiO}_2$) 174180-07-5, Cobalt lithium manganese oxide ($\text{CoO}_{0.7}\text{LiO}_{1.2}\text{Mn}_{1.3}\text{O}_4$) RL: DEV (Device component use); USES (Uses) (cathode; batteries contg. mixed nonaq. solvents contg. ethylene carbonate for energy d. and long life)				
IT	7791-03-9, Lithium perchlorate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate RL: DEV (Device component use); USES (Uses) (electrolyte; batteries contg. mixed nonaq. solvents contg. ethylene carbonate for energy d. and long life)				
IT	96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 110-71-4, 1,2-Dimethoxyethane 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 629-14-1, 1,2-Diethoxyethane 5137-45-1, 1-Ethoxy-2-methoxyethane RL: DEV (Device component use); USES (Uses) (solvent; batteries contg. mixed nonaq. solvents contg. ethylene carbonate for energy d. and long life)				
IT	174015-34-0 , Iron lithium sulfate ($\text{Fe}_2\text{Li}(\text{SO}_4)_3$) RL: DEV (Device component use); USES (Uses) (cathode; batteries contg. mixed nonaq. solvents contg.				

ethylene carbonate for energy d. and long life)
 RN 174015-34-0 HCAPLUS
 CN Iron lithium sulfate (Fe₂Li(SO₄)₃) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O4S	3	14808-79-8
Li	1	7439-93-2
Fe	2	7439-89-6

L21 ANSWER 30 OF 42 HCAPLUS COPYRIGHT 2001 ACS
 AN 1996:121192 HCAPLUS
 DN 124:150896
 TI Secondary battery
 IN Gilmour, Alexander
 PA Lexcel Technology Ltd., UK
 SO PCT Int. Appl., 25 pp.
 CODEN: PIXXD2
 DT Patent
 LA English
 IC ICM H01M010-40
 ICS H01M004-58
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----		-----	-----	-----
PI	WO 9534920	A1	19951221	WO 1995-GB1337	19950608
	W: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT				
	RW: KE, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
	AU 9526778	A1	19960105	AU 1995-26778	19950608
	EP 871986	A1	19981021	EP 1995-921893	19950608
	EP 871986	B1	19991208		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE				
	AT 187581	E	19991215	AT 1995-921893	19950608
	US 5741607	A	19980421	US 1996-765154	19961211
PRAI	GB 1994-12045		19940616		
	WO 1995-GB1337		19950608		

AB The **battery** comprises an **anode**, a **cathode** of an alkali metal (Li) or alk. earth salt of a S oxy-acid (Li₂SO₃) and a transition metal oxide (VO₂, FeO, etc.), and an electrolyte of a **nonaq.** electrolyte contg. a sol. salt of the alkali or alk. earth metal dissolved in the **nonaq.** electrolyte.

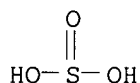
ST **battery cathode** alkali metal salt; alk earth salt **battery cathode**; transition metal oxide **battery cathode**; lithium sulfite vanadium oxide **battery cathode**; iron oxide lithium sulfite **battery cathode**

IT Batteries, secondary (lithium)

IT Cathodes (battery, alkali metal or alk. earth salt and transition metal oxide)

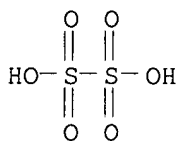
IT 1313-99-1, Nickel oxide (NiO), uses 1317-39-1, Copper oxide (Cu₂O), uses 1345-25-1, Ferrous oxide, uses 12036-21-4, Vanadium oxide (VO₂)
 RL: DEV (Device component use); USES (Uses)

(battery cathodes from lithium sulfite and)
 IT 1314-34-7, Vanadium oxide (V2O3) 1317-34-6, Manganese oxide (Mn2O3)
 1344-43-0, Manganese oxide (MnO), uses 12137-20-1, Titanium monoxide
 RL: TEM (Technical or engineered material use); USES (Uses)
 (battery cathodes from lithium sulfite and)
 IT 13453-87-7, Lithium sulfite (Li2SO3)
 RL: DEV (Device component use); USES (Uses)
 (battery cathodes from transition metal oxide and)
 IT 34669-40-4, Lithium dithionate 59744-77-3, Lithium
 dithionite
 RL: TEM (Technical or engineered material use); USES (Uses)
 (battery cathodes from transition metal oxide and)
 IT 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 14283-07-9,
 Lithium fluoroborate
 RL: DEV (Device component use); USES (Uses)
 (battery electrolyte contg.)
 IT 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate 21324-40-3,
 Lithium hexafluorophosphate 90076-65-6, Lithium
 bis(trifluoromethylsulfonyl)imide
 RL: TEM (Technical or engineered material use); USES (Uses)
 (battery electrolyte contg.)
 IT 13453-87-7, Lithium sulfite (Li2SO3)
 RL: DEV (Device component use); USES (Uses)
 (battery cathodes from transition metal oxide and)
 RN 13453-87-7 HCAPLUS
 CN Sulfurous acid, dilithium salt (8CI, 9CI) (CA INDEX NAME)



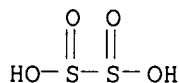
2 Li

IT 34669-40-4, Lithium dithionate 59744-77-3, Lithium
 dithionite
 RL: TEM (Technical or engineered material use); USES (Uses)
 (battery cathodes from transition metal oxide and)
 RN 34669-40-4 HCAPLUS
 CN Dithionic acid, dilithium salt (9CI) (CA INDEX NAME)



2 Li

RN 59744-77-3 HCAPLUS
 CN Dithionous acid, dilithium salt (9CI) (CA INDEX NAME)



2 Li

L21 ANSWER 31 OF 42 HCAPLUS COPYRIGHT 2001 ACS

AN 1996:52876 HCAPLUS

DN 124:122127

TI Prevention of gas formation in especially lithium-manganese dioxide
nonaqueous-electrolyte batteries

IN Merritt, Donald R.

PA Medtronic, Inc., USA

SO U.S., 5 pp. Cont. of U.S. Ser. No. 917,543, abandoned.

CODEN: USXXAM

DT Patent

LA English

IC ICM H01M004-62

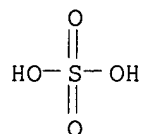
NCL 429057000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5474858	A	19951212	US 1993-157492	19931123
PRAI	US 1992-917543		19920721		
AB	The batteries comprise an active metal anode , an org. electrolyte, and a cathode comprising a minor amt. (.apprx.0.5-2%) of a desiccant which is insol. in the org. electrolyte and nonreactive during the battery discharge. The resulting battery is resistant to internal gas generation. The desiccant is selected from SiO ₂ , Al ₂ O ₃ , P ₂ O ₅ , CaSO ₄ , and MgSO ₄ .				
ST	gas formation prevention lithium battery; battery lithium manganese dioxide gassing prevention; silica desiccant gassing prevention battery; alumina desiccant gassing prevention battery; phosphorus oxide gassing prevention battery; calcium sulfate gassing prevention battery; magnesium sulfate gassing prevention battery				
IT	Batteries, secondary (prevention of gas formation in esp. lithium-manganese dioxide nonaq. -electrolyte)				
IT	Cathodes (battery, desiccant-contg. manganese dioxide for prevention of gas formation)				
IT	1313-13-9, Manganese dioxide, uses RL: DEV (Device component use); USES (Uses) (battery cathodes contg. desiccant for prevention of gas formation)				
IT	1314-56-3, Phosphorus oxide (P ₂ O ₅), uses 1344-28-1, Alumina, uses 7487-88-9 , Sulfuric acid magnesium salt (1:1), uses 7631-86-9, Silica, uses 7778-18-9, Calcium sulfate (CaSO ₄) RL: NUU (Nonbiological use, unclassified); USES (Uses) (for prevention of gas formation in esp. lithium-manganese dioxide nonaq. -electrolyte batteries)				
IT	7487-88-9 , Sulfuric acid magnesium salt (1:1), uses RL: NUU (Nonbiological use, unclassified); USES (Uses) (for prevention of gas formation in esp. lithium-manganese dioxide nonaq. -electrolyte batteries)				

RN 7487-88-9 HCAPLUS
CN Sulfuric acid magnesium salt (1:1) (8CI, 9CI) (CA INDEX NAME)



Mg

L21 ANSWER 32 OF 42 HCAPLUS COPYRIGHT 2001 ACS

AN 1995:922241 HCAPLUS

DN 123:318825

TI **Nonaqueous** electrolyte secondary batteries with improved anodes

IN Shoji, Yoshihiro; Suemori, Atsushi; Yamamoto, Juji; Kida, Yoshinori;
Yamazaki, Mikya; Nishio, Koji; Saito, Toshihiko

PA Sanyo Electric Co, Japan

SO Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H01M004-02

ICS H01M004-64; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 07235297	A2	19950905	JP 1994-225929	19940825
PRAI	JP 1993-350461		19931227		

AB The batteries contg. **nonaq.** electrolyte solns. contg. F-contg.

Li salts comprise anodes contg. Li ion intercalating C materials mixed with with 1-100 parts (to 100 parts F-contg. Li salts) Li₂CO₃, LiOH, LiCl, LiF, LiBr, LiI, Li₂O, Li₂S, Li₃N, Li₃P, LiNO₃, Li₂SO₄, and/or Li₃PO₄. The F-contg. Li salts may be LiPF₆, LiBF₄, LiAsF₆, LiCF₃SO₃, or LiN(CF₃SO₂)₂. The batteries have long cycle life and storage stability.

ST electrolyte lithium fluoride battery; lithium intercalating carbon
anode battery

IT Anodes

(battery, lithium-intercalating carbon anodes contg. lithium compds.
for batteries for cycle life and storage stability)

IT 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses

RL: DEV (Device component use); USES (Uses)

(**anode**; lithium-intercalating carbon anodes contg. lithium
compds. for batteries for cycle life and storage stability)

IT 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium
hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9,
Lithium trifluoromethanesulfonate 90076-65-6, Lithium
bis(trifluoromethanesulfonyl)imide

RL: DEV (Device component use); USES (Uses)

(electrolyte; lithium-intercalating carbon anodes contg. lithium
compds. for batteries for cycle life and storage stability)

IT 554-13-2, Lithium carbonate 1310-65-2, Lithium hydroxide 7447-41-8,
Lithium chloride, uses 7550-35-8, Lithium bromide 7789-24-4, Lithium
fluoride, uses 7790-69-4, Lithium nitrate 10377-48-7, Lithium

sulfate 10377-51-2, Lithium iodide 10377-52-3, Lithium phosphate 12057-24-8, Lithium oxide, uses 12057-29-3, Lithium phosphide (Li3P) 12136-58-2, Lithium sulfide 26134-62-3, Lithium nitride
 RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)

(lithium-intercalating carbon anodes contg. lithium compds. for batteries for cycle life and storage stability)

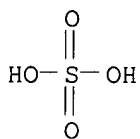
IT 10377-48-7, Lithium sulfate

RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)

(lithium-intercalating carbon anodes contg. lithium compds. for batteries for cycle life and storage stability)

RN 10377-48-7 HCAPLUS

CN Sulfuric acid, dilithium salt (8CI, 9CI) (CA INDEX NAME)



●2 Li

L21 ANSWER 33 OF 42 HCAPLUS COPYRIGHT 2001 ACS

AN 1995:563259 HCAPLUS

DN 122:295298

TI **Cathode** for rechargeable lithium-containing **battery**

IN Lecerf, Andre; Biensan, Philippe; Baudry, Sylvie

PA SAFT, Fr.

SO Eur. Pat. Appl., 17 pp.

CODEN: EPXXDW

DT Patent

LA French

IC ICM H01M004-50

ICS H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

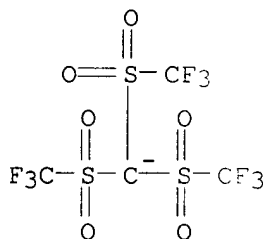
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 633617	A1	19950111	EP 1994-401554	19940706
	EP 633617	B1	19980128		
	R: BE, DE, FR, GB				
	FR 2707426	A1	19950113	FR 1993-8484	19930709
	FR 2707426	B1	19950818		
	JP 07057783	A2	19950303	JP 1994-157619	19940708
	US 5561006	A	19961001	US 1994-271979	19940708
PRAI	FR 1993-8484		19930709		

AB The **battery** contains a **cathode** consisting of a single-phase orthorhombic Mn-Li oxide (lattice parameters a = 0.459+-0.004 nm; b = 0.577+-0.004 nm; c = 0.281+-0.003 nm; Li/Mn mol ratio 0.85-1.10) in addn. to a Li or Li alloy **anode** and an electrolyte consisting of a Li salt soln. in a **nonaq.** solvent. After the 1st charging, the **battery cathode** is discharged in 2 stages with the higher stage having an av. voltage >3.5 V in relation to Li. During the cathode prepn., the powd. mixt. is

subjected to thermal treatment in a nonoxidizing atm. with the max. temp. at 500-900.degree..

- ST **cathode** rechargeable lithium **battery**; lithium manganese oxide **cathode battery**
- IT Batteries, secondary
(button-type; performance of lithium batteries with lithium-manganese cathodes)
- IT Cathodes
(battery, compn. and prepn. of lithium-manganese oxide cathodes for rechargeable button-type batteries)
- IT 12162-79-7 163215-54-1, Lithium manganese oxide (Li0.97MnO1.99)
163215-55-2, Lithium manganese oxide (Li1.05MnO2.02)
RL: DEV (Device component use); USES (Uses)
(cathode for rechargeable button-type lithium batteries)
- IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate 4437-85-8, Butylene carbonate 7791-03-9 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium trifluoromethanesulfonate 90076-65-6 **132404-42-3**
RL: TEM (Technical or engineered material use); USES (Uses)
(in electrolyte for rechargeable button-type lithium batteries)
- IT **132404-42-3**
RL: TEM (Technical or engineered material use); USES (Uses)
(in electrolyte for rechargeable button-type lithium batteries)
- RN 132404-42-3 HCAPLUS
- CN Methane, tris[(trifluoromethyl)sulfonyl]-, ion(1-), lithium (9CI) (CA INDEX NAME)



● Li⁺

- L21 ANSWER 34 OF 42 HCAPLUS COPYRIGHT 2001 ACS
- AN 1994:413936 HCAPLUS
- DN 121:13936
- TI **Cathode** material and secondary **battery**
- IN Okada, Shigeto; Ohtsuka, Hideaki; Arai, Hajime; Shibata, Masasi; Ichimura, Masahiro
- PA Nippon Telegraph and Telephone Corp., Japan
- SO Eur. Pat. Appl., 17 pp.
CODEN: EPXXDW
- DT Patent
- LA English
- IC ICM H01M04-00
ICS H01M04-58
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

L21 ANSWER 34 OF 42 HCAPLUS COPYRIGHT 2001 ACS
 AN 1994:413936 HCAPLUS
 DN 121:13936
 TI **Cathode material and secondary battery**
 IN Okada, Shigeto; Ohtsuka, Hideaki; Arai, Hajime; Shibata, Masasi; Ichimura, Masahiro
 PA Nippon Telegraph and Telephone Corp., Japan
 SO Eur. Pat. Appl., 17 pp.
 CODEN: EPXXDW
 DT Patent
 LA English
 IC ICM H01M004-00
 ICS H01M004-58
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 592301	A1	19940413	EP 1993-402443	19931005
	EP 592301	B1	19970122		
	R: DE, FR				
	JP 06119926	A2	19940428	JP 1992-292195	19921006
	JP 2847663	B2	19990120		
	CA 2107440	AA	19940407	CA 1993-2107440	19930930
	CA 2107440	C	19980623		
	US 5415957	A	19950516	US 1993-130194	19931001
PRAI	JP 1992-292195		19921006		
AB	A cathode material made of anhyd. ferric sulfate with a hexagonal crystal structure is used in a secondary battery which generates a stable open-circuit-voltage of about 3.6 V and offers a recharge cycling capacity of >100 times. The cathode material is obtained by heating hydrous iron sulfate at 250-600.degree. to remove the water of crystn. The secondary battery with this cathode material provides a long-service life and a stable output voltage economically, because the starting material, iron sulfate, is abundantly available at relatively low cost.				
ST	ferric sulfate cathode secondary battery				
IT	Carbon black, uses				
	RL: USES (Uses)				
	(cathode contg., ferric sulfate, anhyd., with hexagonal crystal sym.)				
IT	Batteries, secondary				
	(lithium/ferric sulfate, nonaq. , with stable output voltage)				
IT	Cathodes				
	(battery, ferric sulfate, anhyd., with hexagonal crystal sym.)				
IT	Lithium alloy, base				
	RL: USES (Uses)				
	(anode, in battery with anhyd. ferric sulfate				
	cathode with hexagonal crystal sym.)				
IT	12798-95-7, Aluminum lithium				
	RL: USES (Uses)				
	(alloys, anode, in battery with anhyd. ferric sulfate				
	cathode with hexagonal crystal sym.)				
IT	554-13-2, Lithium carbonate 7439-93-2, Lithium, uses 7439-93-2D,				
	Lithium, compds. 7790-69-4, Lithium nitrate				
	RL: USES (Uses)				
	(anode, in battery with anhyd. ferric sulfate				
	cathode with hexagonal crystal sym.)				
IT	9002-84-0, Ptfе				
	RL: USES (Uses)				
	(cathode contg., ferric sulfate, anhyd., with hexagonal crystal sym.)				
IT	7783-83-7	7783-85-9	10124-49-9, Iron sulfate	15244-10-7, Ferric	

sulfate hydrate

RL: USES (Uses)

(ferric sulfate from, anhyd., with hexagonal crystal sym.,
battery cathode)

IT 67-68-5, Dimethylsulfoxide, uses 68-12-2, uses 75-05-8, Acetonitrile,
uses 96-47-9, 2-Methyltetrahydrofuran 96-48-0, .gamma.-Butyrolactone
96-49-1, 1,3-Dioxolan-2-one 105-58-8, Diethylcarbonate 107-31-3,
Methyl formate 108-32-7, Propylene carbonate 109-99-9, uses
110-71-4, 1,2-Dimethoxyethane 556-65-0 616-38-6, Dimethylcarbonate
623-53-0, Methyleneethylcarbonate 646-06-0, 1,3-Dioxolane 1003-30-1,
2-Ethyltetrahydrofuran 1072-47-5, 4-Methyl-1,3-dioxolane 2923-17-3
7447-41-8, Lithium chloride, uses 13453-71-9, Lithium chlorate
14024-11-4, Aluminum lithium chloride (allicl4) 14283-07-9 14485-20-2,
Lithium tetraphenylborate 18165-68-9, Diethoxysilane 18424-17-4
21324-40-3 29935-35-1, Arsenic lithium fluoride (aslif6) 33454-82-9
61852-37-7 62852-65-7 **132404-42-3** 153347-65-0, Lithium
tetrakis-(3,5-bis(trifluoromethyl)phenyl)borate
RL: USES (Uses)

(**nonaq.** electrolyte, in **battery** with anhyd. ferric
sulfate **cathode** with hexagonal crystal sym.)

IT 10028-22-5

RL: USES (Uses)

(with hexagonal crystal sym., **battery cathode**)

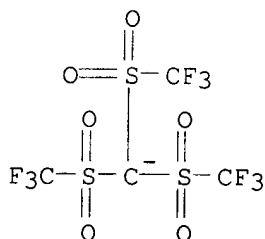
IT **132404-42-3**

RL: USES (Uses)

(**nonaq.** electrolyte, in **battery** with anhyd. ferric
sulfate **cathode** with hexagonal crystal sym.)

RN 132404-42-3 HCAPLUS

CN Methane, tris[(trifluoromethyl)sulfonyl]-, ion(1-), lithium (9CI) (CA
INDEX NAME)



● Li⁺

L21 ANSWER 35 OF 42 HCAPLUS COPYRIGHT 2001 ACS

AN 1992:411440 HCAPLUS

DN 117:11440

TI **Nonaqueous** battery for delivering high current densities in wide
temperature range

IN Chenebault, Philippe; Planchat, Jean Pierre; Keriven-Lojou, Elisabeth
PA Commissariat a l'Energie Atomique, Fr.; Societe des Accumulateurs Fixes et
de Traction (SAFT)

SO PCT Int. Appl., 19 pp.

CODEN: PIXXD2

DT Patent

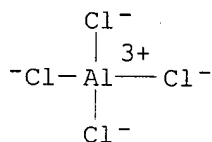
LA French

IC ICM H01M006-14
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9120103	A1	19911226	WO 1991-FR477	19910613
	W: JP, US				
	RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, NL, SE				
	FR 2663467	A1	19911220	FR 1990-7408	19900614
PRAI	FR 1990-7408		19900614		
AB	The battery has a Li anode and the cathode -active mass based on SO ₂ Cl ₂ contains a redn. catalyst (Pt, activated C, Br). The electrolyte is a (2.8-3.2):1 (mol ratio) SO ₂ -NaAlCl ₄ complex. The cathode-active mass is present at 2-6 mol/L.				
ST	battery lithium nonaq electrolyte				
IT	Batteries, secondary (lithium-sulfur oxychloride, high c.d.)				
IT	7440-44-0, Carbon, uses RL: USES (Uses) (activated, catalysts, in lithium batteries with nonaq. electrolyte)				
IT	7440-06-4, Platinum, uses 7726-95-6, Bromine, uses RL: CAT (Catalyst use); USES (Uses) (catalysts, in lithium batteries with nonaq. electrolyte)				
IT	141970-29-8 RL: USES (Uses) (electrolyte, for lithium batteries)				
IT	141970-29-8 RL: USES (Uses) (electrolyte, for lithium batteries)				
RN	141970-29-8 HCAPLUS				
CN	Aluminate(1-), tetrachloro-, (T-4)-, sodium, compd. with sulfur dioxide (9CI) (CA INDEX NAME)				

CM 1

CRN 7784-16-9
 CMF Al Cl₄ . Na
 CCI CCS
 CDES 7:T-4



● Na⁺

CM 2

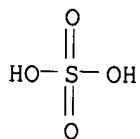
CRN 7446-09-5
 CMF O2 S

O=S=O

L21 ANSWER 36 OF 42 HCAPLUS COPYRIGHT 2001 ACS
AN 1987:537607 HCAPLUS
DN 107:137607
TI Secondary **nonaqueous** batteries
IN Kobayashi, Masao; Shishikura, Riichi; Nakamura, Hidenori; Sakai,
Toshiyuki; Konuma, Hiroshi; Takeuchi, Masataka
PA Showa Denko K. K., Japan; Hitachi, Ltd.
SO Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38.

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	-----
PI	JP 62035465	A2	19870216	JP 1985-172422	19850807
AB	The batteries have a polyaniline cathode an electrolyte soln. contg. Li+ and Na+, K+, Mg2+, and/or Al3+ ions. A 1 LiBF4 and 0.1M NaBF4/1:1 (vol.) propylene carbonate-MeOC2H4OMe electrolyte was used in a battery having a polyaniline cathode and a polyacetylene anode . The battery showed longer cycle life and lower self discharge than a battery using an electrolyte without NaBF4.				
ST	battery electrolyte sodium tetrafluoroborate additive; lithium sodium tetrafluoroborate battery electrolyte				
IT	Batteries, secondary (polyaniline, with nonaq. lithium tetrafluoroborate electrolytes contg. additives)				
IT	10034-81-8, Magnesium perchlorate 10043-01-3 , Aluminum sulfate 13755-29-8, Sodium tetrafluoroborate 17084-13-8, Potassium hexafluorophosphate RL: USES (Uses) (electrolytes contg., lithium tetrafluoroborate, for batteries with polyaniline cathodes)				
IT	14283-07-9, Lithium tetrafluoroborate RL: USES (Uses) (electrolytes, contg. additives, for batteries with polyaniline cathodes)				
IT	10043-01-3 , Aluminum sulfate RL: USES (Uses) (electrolytes contg., lithium tetrafluoroborate, for batteries with polyaniline cathodes)				
RN	10043-01-3 HCAPLUS				
CN	Sulfuric acid, aluminum salt (3:2) (8CI, 9CI) (CA INDEX NAME)				



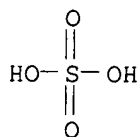
2/3 A1

L21 ANSWER 37 OF 42 HCAPLUS COPYRIGHT 2001 ACS
 AN 1987:443144 HCAPLUS
 DN 107:43144
 TI Secondary polymer batteries
 IN Nishimura, Shigeoki; Sugimoto, Hiroyuki; Toyama, Atsuko; Ebato, Noboru;
 Fujita, Kazunori; Matsuda, Shinpei
 PA Showa Denko K. K., Japan; Hitachi, Ltd.
 SO Jpn. Kokai Tokkyo Koho, 4 pp.
 CODEN: JKXXAF

DT Patent
 LA Japanese
 IC ICM H01M010-40
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 62002469	A2	19870108	JP 1985-140488	19850628
AB	The title batteries have polymer cathodes, metal anodes, and an electrolyte with the anion being the main current carrier. A battery using a polyacetylene cathode with a Pt collector, a Mg (or alloy) anode , and satd. MgCl ₂ /propylene carbonate as electrolyte soln. was cycled at 5-mA/cm ² charging and discharging to 4 mol% doping (Cl ⁻ as dopant). The cycle life (with voltage decreasing to 0.5 V at the end of discharging) was 400 cycles; no dendrite formation was obsd. on the anode .				
ST	magnesium polymer battery dendrite prevention; anion doping polymer cathode; chloride doping polyacetylene cathode				
IT	Batteries, secondary (metal-polymer, anion-conductive electrolyte soln. in, for prevention of dendrite growth)				
IT	7439-95-4, Magnesium, uses and miscellaneous			75478-14-7	
	RL: USES (Uses) (anodes, prevention of dendrite growth on, in secondary nonaq batteries)				
IT	25067-58-7, Polyacetylene RL: USES (Uses) (cathodes, in secondary magnesium batteries with anion-conductive electrolytes, for prevention of dendrite growth)				
IT	25233-30-1, Polyaniline		25233-34-5, Polythiophene		
	RL: USES (Uses) (cathodes, in secondary magnesium batteries with anion-conductive electrolytes, for prevention of dendrite growth)				
IT	7447-41-8, Lithium chloride, uses and miscellaneous			7786-30-3, Magnesium dichloride, uses and miscellaneous	
	RL: USES (Uses) (electrolytes, secondary batteries contg. anion-conductive, for				

prevention of magnesium dendrite growth)
 IT 10377-48-7, Lithium sulfate
 RL: USES (Uses)
 (electrolytes, secondary batteries contg. anion-conductive, for
 prevention of magnesium dendrite growth)
 RN 10377-48-7 HCAPLUS
 CN Sulfuric acid, dilithium salt (8CI, 9CI) (CA INDEX NAME)



2 Li

L21 ANSWER 38 OF 42 HCAPLUS COPYRIGHT 2001 ACS
 AN 1987:179815 HCAPLUS
 DN 106:179815
 TI Battery
 IN Lausten, Mads Aage; Kummel, Karen
 PA Hellesens A/S, Den.
 SO Brit. UK Pat. Appl., 6 pp.
 CODEN: BAXXDU
 DT Patent
 LA English
 IC ICM H01M006-14
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology).
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	GB 2176928	A1	19870107	GB 1986-12757	19860527
	GB 2176928	B2	19881207		
	DK 8502732	A	19861218	DK 1985-2732	19850617
	DK 155560	B	19890417		
	DK 155560	C	19890918		
	US 4714664	A	19871222	US 1986-868796	19860529
	FR 2584869	A1	19870116	FR 1986-8674	19860616
	JP 62043070	A2	19870225	JP 1986-139381	19860617
PRAI	DK 1985-2732		19850617		

AB A **nonaq.**-electrolyte **battery** of SOCl₂ or SO₂Cl₂ and Group 1 or 2 (IA or IIA) metal **anode** has a decreased delayed action (DA) when the electrolyte contains a SO₃ compd. such as stabilized SO₃, pyridine S trioxide (C₅H₅NSO₃), or LiSO₃X, where X = F-, Cl-, or Br-. The electrolyte contains also 0.02-0.30M LiNbCl₆ or LiTaCl₆. Li/1.8M LiAlCl₄-SOCl₂ batteries with C current collector contg. LiSO₃Cl 0.16, C₅H₅NSO₃ 0.11, or C₅H₅NSO₃ 0.11 + LiNbCl₆ 0.09M in the catholyte showed decreased DA and capacities comparable or higher than a control battery without additives in the catholyte after 2-wk storage at 45 or 70.degree..
 ST lithium thionyl chloride battery; battery lithium delayed action; sulfur oxide lithium battery; pyridine sulfur oxide lithium battery; niobium lithium chloride battery; chlorosulfonate lithium thionyl chloride battery; chloroniobate lithium thionyl chloride battery
 IT Batteries, primary
 (lithium-thionyl chloride, with **nonaq.** electrolyte contg.)

stabilized sulfur trioxide compd. for decreased delayed action and high capacity)

IT 7446-11-9, Sulfur trioxide, uses and miscellaneous 19744-12-8, Lithium chlorosulfonate 26412-87-3, Pyridine sulfur trioxide 90317-33-2, Lithium chloroniobate (LiNbCl6)

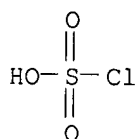
RL: USES (Uses)
(thionyl chloride contg., for decreased delayed action and high capacity lithium batteries)

IT 19744-12-8, Lithium chlorosulfonate

RL: USES (Uses)
(thionyl chloride contg., for decreased delayed action and high capacity lithium batteries)

RN 19744-12-8 HCAPLUS

CN Chlorosulfuric acid, lithium salt (8CI, 9CI) (CA INDEX NAME)



Li

L21 ANSWER 39 OF 42 HCAPLUS COPYRIGHT 2001 ACS

AN 1985:116658 HCAPLUS

DN 102:116658

TI **Nonaqueous** battery

PA Sanyo Electric Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 2 pp.
CODEN: JKXXAF

DT Patent

LA Japanese

IC H01M006-16

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	-----
PI	JP 59205162	A2	19841120	JP 1983-81268	19830509
	JP 04027674	B4	19920512		

AB A **nonaq. battery** having a light-metal (e.g. Li, Na) **anode** uses as electrolyte Li toluenesulfonate [1470-83-3] or mixts. contg. it. The battery operates well at low temp. Thus, a Li **battery** was prepd. contg. a 85:10:5 MnO2-C powder-fluororesin mixt. **cathode** and a M Li 4-toluenesulfonate in 1:1 propylene carbonate-MeOCH2CH2OMe electrolyte. The battery provided higher discharge voltage at -20.degree., than batteries using M LiClO4, LiBF4, or LiPF6.

ST battery electrolyte lithium toluenesulfonate; manganese dioxide lithium battery electrolyte

IT Batteries, primary
(lithium-manganese dioxide, lithium toluene sulfonate electrolytes for)

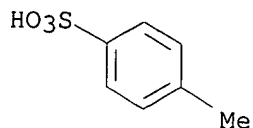
IT 1470-83-3

RL: USES (Uses)
(battery electrolytes, lithium-manganese dioxide)

IT 1470-83-3

RL: USES (Uses)

(battery electrolytes, lithium-manganese dioxide)
 RN 1470-83-3 HCAPLUS
 CN Benzenesulfonic acid, 4-methyl-, lithium salt (9CI) (CA INDEX NAME)



● Li

L21 ANSWER 40 OF 42 HCAPLUS COPYRIGHT 2001 ACS

AN 1983:512948 HCAPLUS

DN 99:112948

TI **Nonaqueous** electrolyte battery

PA Sanyo Electric Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 3 pp.

CODEN: JKXXAF

DT Patent

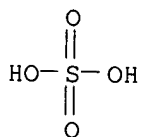
LA Japanese

IC H01M004-48

CC 72-3 (Electrochemistry)

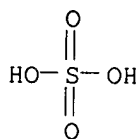
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 58061561	A2	19830412	JP 1981-161705	19811008
AB	In a nonaq. electrolyte battery having a light metal (e.g. Li, Na, etc.) as the anode active material and CuO as the cathode active material, anhyd. CuSO ₄ is added to the cathode mix. Anhyd. CuSO ₄ removes the traces of water present which might otherwise cause an increase in internal resistance of the battery.				
ST	battery cupric sulfate additive cathode ; copper oxide cathode nonaq battery				
IT	Batteries, primary				
	(nonaq., cupric sulfate additive to cupric oxide cathodes in)				
IT	Cathodes				
	(battery, cupric oxide, with cupric sulfate additive)				
IT	7758-98-7 , uses and miscellaneous				
	RL: USES (Uses)				
	(cathodes from cupric oxide and, for nonaq. electrolyte batteries)				
IT	1317-38-0, uses and miscellaneous				
	RL: USES (Uses)				
	(cathodes, for nonaq. electrolyte batteries, cupric sulfate additive for)				
IT	7758-98-7 , uses and miscellaneous				
	RL: USES (Uses)				
	(cathodes from cupric oxide and, for nonaq. electrolyte batteries)				
RN	7758-98-7 HCAPLUS				
CN	Sulfuric acid copper(2+) salt (1:1) (8CI, 9CI) (CA INDEX NAME)				



Cu(II)

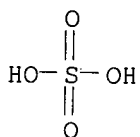
L21 ANSWER 41 OF 42 HCAPLUS COPYRIGHT 2001 ACS
 AN 1972:161519 HCAPLUS
 DN 76:161519
 TI Copper(II) sulfate-lithium couple as a battery
 AU Caiola, A.; Faudou, J. Y.; Guy, H.; Sohm, J. C.
 CS Ec. Electrochim. Electrometall., Martin d'Herès, Fr.
 SO Electrochim. Acta (1972), 17(3), 421-40
 CODEN: ELCAAV
 DT Journal
 LA French
 CC 77 (Electrochemistry)
 AB The Li-CuSO₄ couple has a high energy d., 1060 W-hr/kg, and a high emf., 3.41 V. CuSO₄ is not sol. in the electrolyte, and though there is SO₄²⁻ in soln., it does not form complexes. Li₂SO₄ is slightly sol.; thus, when the **neg. electrode** is charged there is no formation of dendrites. The org. solvent is Me₂SO₄. The best electrolyte compn. is 0.25M (Bu₄N)₂SO₄ and 1.25M Bu₄NClO₄. The ClO₄⁻ prevents passivation of the Li electrode. The Li₂SO₄-Li and CuSO₄-Cu systems are reversible. Li is not thermodynamically stable in contact with Me₂SO₄; it reacts slowly and C₂H₆ is evolved. No material was found that could be added to Li to improve the specific area of the electrode.
 ST battery copper sulfate lithium couple
 IT Batteries, primary
 (lithium-cupric sulfate, in dimethylsulfate)
 IT 7439-93-2, uses and miscellaneous
 RL: USES (Uses)
 (anodes, in **nonaq.** battery with cupric sulfate)
 IT **7758-98-7**, uses and miscellaneous
 RL: USES (Uses)
 (cathodes, in **nonaq.** lithium battery)
 IT 14797-73-0
 RL: PRP (Properties)
 (in cupric sulfate-lithium **battery**, to prevent passivation of lithium **anode**)
 IT **7758-98-7**, uses and miscellaneous
 RL: USES (Uses)
 (cathodes, in **nonaq.** lithium battery)
 RN 7758-98-7 HCAPLUS
 CN Sulfuric acid copper(2+) salt (1:1) (8CI, 9CI) (CA INDEX NAME)



Cu(II)

L21 ANSWER 42 OF 42 HCAPLUS COPYRIGHT 2001 ACS
 AN 1972:135083 HCAPLUS
 DN 76:135083
 TI Rechargeable **battery** containing a lithium **anode**
 IN Caiola, Amedee; Guy, Henri; Sohm, Jean C.
 PA Societe des Accumulateurs Fixes et de Traction
 SO Fr., 6 pp.
 CODEN: FRXXAK
 DT Patent
 LA French
 IC H01M
 CC 77 (Electrochemistry)
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	FR 2068146		19710924	FR 1969-41156	19691128
AB	Cu sulfate forms the pos. electroactive species in a rechargeable, battery having a Li anode . The nonaq. electrolyte consists of a mixt. (total M <1.9) of (Bu4N)2SO4 (0.15-0.35M) and Bu4NClO4 (1.3-1.7M) in Me2SO4.				
ST	rechargeable battery lithium anode ; electrolyte nonaq battery				
IT	Batteries, secondary (lithium-cupric sulfate)				
IT	7439-93-2, uses and miscellaneous RL: USES (Uses) (anodes, in secondary battery with cupric sulfate)				
IT	7758-98-7 , uses and miscellaneous RL: USES (Uses) (in secondary battery, with lithium)				
IT	7758-98-7 , uses and miscellaneous RL: USES (Uses) (in secondary battery, with lithium)				
RN	7758-98-7 HCAPLUS				
CN	Sulfuric acid copper(2+) salt (1:1) (8CI, 9CI) (CA INDEX NAME)				



● Cu(II)

